cristie bare machine recovery

CBMR

CBMR for Linux - User Guide

March 2007

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1 Introduction

1.1 Purpose

The purpose of this document is to identify the most commonly used features of CBMR for Linux and thereby help the new user to understand the CBMR process and perform their first recovery.

1.2 Version

The descriptions contained in this document relate to CBMR for Linux version 2.

1.3 Limitations

A list of compatible software and file systems is given in Appendix A.

There are limits to what this version of CBMR for Linux will handle. It will NOT handle:

- Platforms other than Intel
- Multiboot operating systems
- Incremental and differential backups
- Backup of open files
- Recovery to a smaller disk or fewer disks

1.4 Document Structure

This guide is split into sections in the order in which you are likely to use them. The sections describe how you

- Install
- Perform a DR Backup
- Perform a Disaster Recovery

More information is available from the man pages for each of the CBMR components ubax, gubax, mkdisrec and gdisrec

1.5 Prerequisites

CBMR for Linux can be installed on a x86 Linux PC with glibc >= 2.2. Your system should have ITSM API client already installed. Recovery requires at least 128MB RAM.

CBMR relies on the following packages which should be pre-installed:

libc - either glibc2.2 or glibc2.3

libacl - specifically libacl.so.1

libattr - specifically libattr.so.1

ncurses - specifically libmenu.so.5, libform.so.5, libpanel.so.5 and libncurses.so.5 if you wish to use the graphical user interface

ITSM client - specifically libApiDS.so if you wish to use the IBM Tivoli Storage Manager interface

mkinitrd

1.6 The CBMR Process

Cristie Bare Machine Recovery (CBMR) will recover your Windows machine in the event of a disaster. It can backup to tape drives, virtual tape drives, IBM Tivoli Storage Manager (ITSM) and cascaded devices. Extra modules are available to support tape libraries and autochangers, and Cristie Storage Manager (CSM) devices.

The processes may be run either from the Command line or a GUI interface. DR (Disaster Recovery) Backups can be taken periodically to reflect the changing content of the machine. In order to be able to recover this data, the machine configuration information must also be saved. This includes details of hard disks and network interfaces.

CBMR recognises three components needed for the recovery of any computer. These are

Configuration data - defining the structure of the machine and its network characteristics,

DR Backup data - required to recover the operating system on that structure, and

Application data - required to recover the applications and user data on top of the basic operating system.

Each of these elements will change at a different rate and is therefore best backed up on separate schedules.

The main steps when performing the DR Backup for the first time are:

Create a Backup Location

Save Configuration Data

Perform a DR Backup

The main steps when performing a recovery of the operating system are:

Boot the recovery OS

Establish Network connection

Load Configuration Data

Recreate the disk structures

Restore the OS files from the DR Backup

Reboot to the recovered OS

Thereafter you should recover the Application data.

2 Installation

Install CBMR for Linux from the CDROM. There are 2 available versions to support both glibc 2.2 and 2.3. The glibc 2.2 files are contained in the `linux/install/glibc22` directory and the glibc 2.3 files are contained in `install/glibc23`.

If you do not know which version of glibc your Linux distribution uses, there are readme.txt files in both directories explaining which common distributions are supported by which files. Alternatively, the command `/lib/libc.so.6` will identify the version of the GNU C Library.

2.1 Load

Login as `root`

Create a mount point for the CD-ROM with `mkdir /mnt/cdrom`

Mount the installation CD by typing mount `/dev/cdrom /mnt/cdrom`

(Modify this appropriately if your CD-ROM drive is a different device node.)

2.2 Install

If you are using CBMR with ITSM, the ITSM client should be installed first.

If your system supports Redhat Package Manager (RPM), this is the simplest way to install CBMR. To install from an RPM package:

```
cd /mnt/cdrom/linux/install/glibc2x
```

and then either

```
rpm -i  cbmr-2.00-1.i386.rpm
```
(for install *with ITSM* client)

N.B. If you use this command and the ITSM Client has NOT been previously installed, you will see the error noting that libApiDS.so is missing.

If you are using a GUI with a folder view then you may install by double-clicking the file icon.

or

```
rpm -i –-nodeps  cbmr-2.00-1.i386.rpm
```
(for install *without ITSM* client)

If you do not have RPM available, you may install the gzipped tar file as follows:

```
cd /tmp
tar xvzf /mnt/cdrom/linux/install/glibc2x/cbmr-2.00-
1.linux.i686.tar.gz
cd cbmr
./install
```

2.3 Licence

This will install all the relevant files and a 30-day trial licence. If you have purchased a full licence you will have been sent a 12 character licence key (xxxxxxxxxxxx). This may be applied with the command

```
ubax --licence cbmr:xxxxxxxxxxxx
```

2.4 Uninstall

To uninstall the package, use the install script with -u option i.e.

```
./install -u
```

To uninstall the RPM package, use

```
rpm -e cbmr
```

3 Performing a DR Backup

The process of performing a DR backup requires three steps

- Create a Backup Location (which defines where the backup data will be stored)
- Perform a Backup (to the storage device)
- Save the Configuration Data

3.1 Creating a Backup Location

A Backup Location is a definition of the entity to which you will backup data. CBMR can backup to tape drives, tape libraries, virtual tape drives (files), ITSM Nodes and cascaded locations. The simplest way of creating a device is to use the GUI. However you may also create the definition with a text editor.

The Backup Location definition is used in both the DR Backup and the Configuration Data.

3.1.1 Command Line Interface

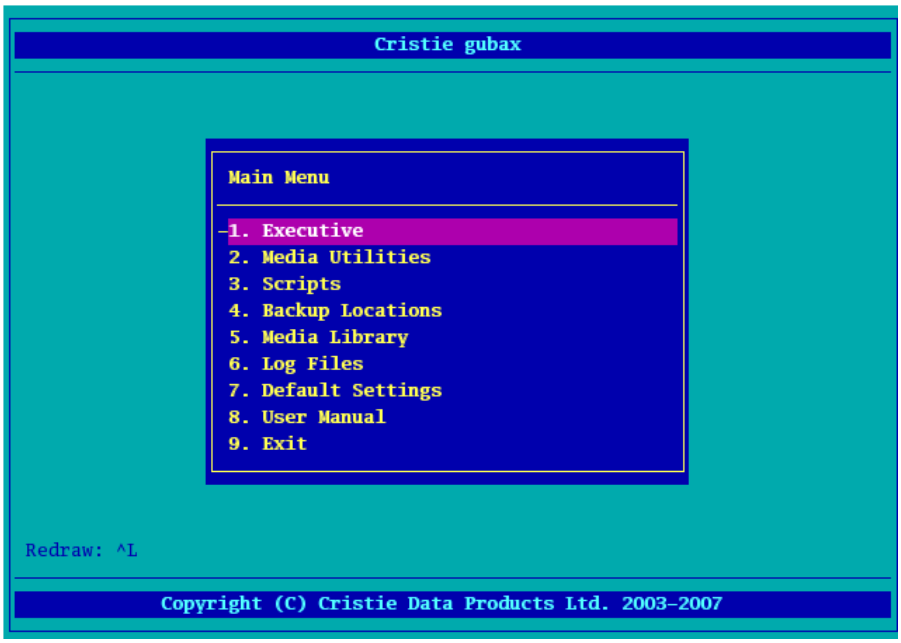
It is unusual to define storage devices without the GUI. However, provided that you do not need to enter an encrypted password, you may use a text editor to create a devices.ini file. Only ITSM and File Backup Locations can be handled this way. The devices.ini file which is located in `/etc/cristie` could be amended or created with entries like:

```
[CBMRLinux]
Class = 4
Path=/mnt/windows/backups/drbackup.vtd
SizeInMB=0
Remote=0
```

However it is *not* recommended that this be done with an editor. Backup Locations are best defined using the GUI.

3.1.2 Graphical User Interface - gubax

To run gubax, type `gubax`. This will show the main menu.

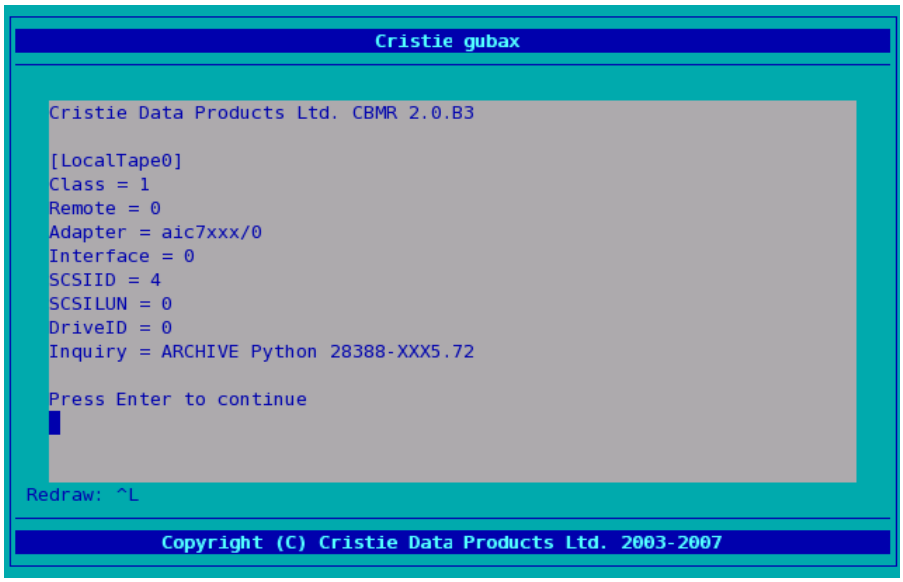


Before you start a DR Backup or save your Configuration Data you need to configure a Backup Location to define the location to which the data will be backed up. Select BACKUP LOCATIONS from the Main Menu.

Tape Drive

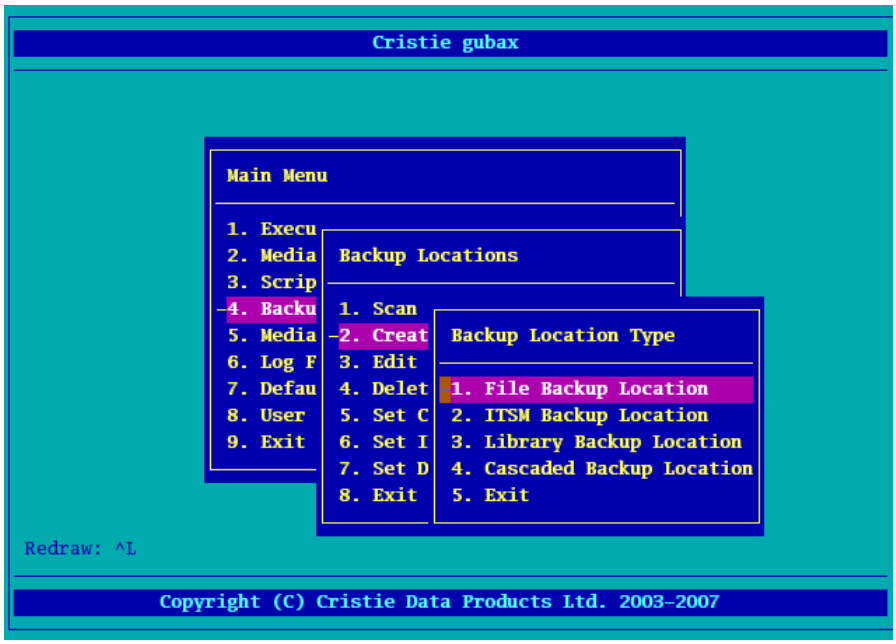
If you are using a tape drive, this can be automatically detected by using the SCAN NEW BACKUP LOCATIONS option from the Backup Locations menu.

Any new devices found will be listed and will then be available to choose as default device.



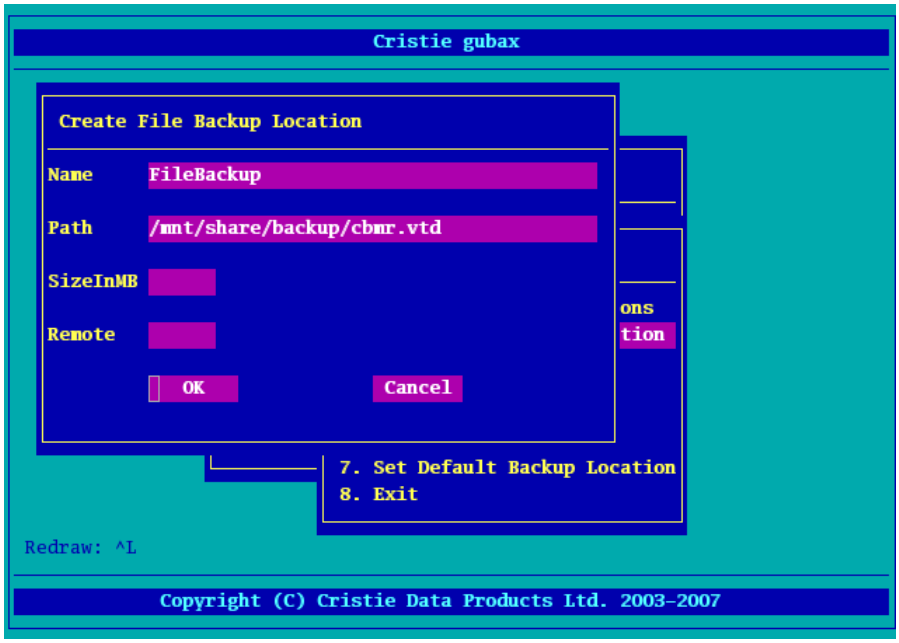
Here the new Backup Location is named LocalTape0

Other types of device should be configured manually. Choose CREATE NEW BACKUP LOCATION from the Backup Locations menu.



File Backup Location

A File Backup Location is a file that is formatted like a tape. If you wish to backup to a file, probably located on a network share, choose FILE BACKUP LOCATION and fill in the form with the details. The Path, which is case sensitive, defines the file via its mount point (which must already be mounted). It is recommended that you leave both SizeInMB and Remote blank or set to zero. SizeInMB will set a maximum size to the file; zero will allow it to expand until it is complete or there is no more space on the disk.The Remote field is used to indicate that Cristie Storage Manager is being used.



N.B. If you do set the maximum size of the file and the backup and the file reaches that size and needs to write more, you will get the message 'Please mount Volume 1'. There is no way to extend the current file or to attach another file and the process should be restarted. If you wish to limit the size of the file because of disk space limitations, then consider creating this as one of several files in a Cascaded Backup Location.

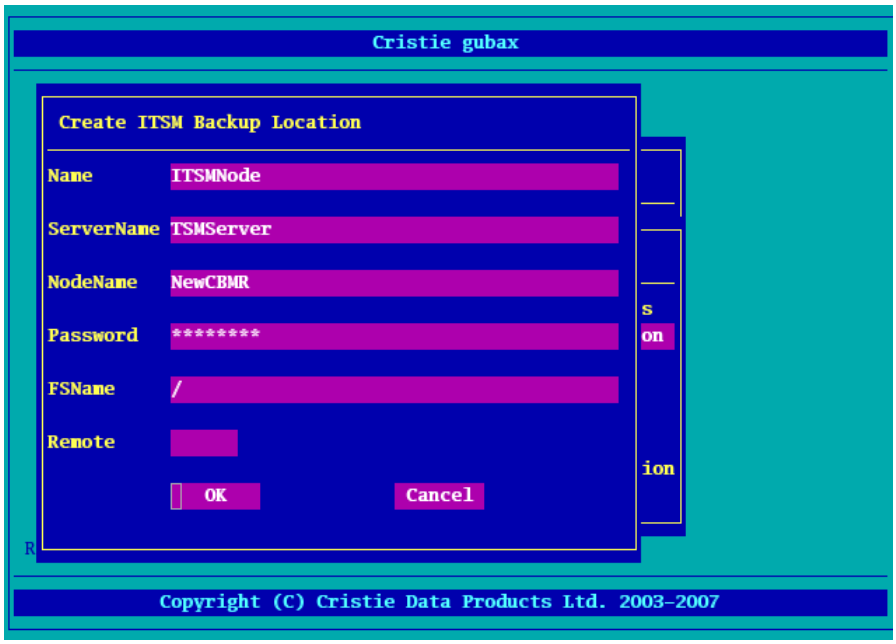
Creating the definition does not create the file itself. This is created when you start the first backup.

ITSM Backup Location

An ITSM node is a port to a network storage system. Currently CBMR treats a node as though it were a tape. This means that there are some restrictions to the way in which CBMR can be configured and used with ITSM. If you wish to use an ITSM node choose ITSM BACKUP LOCATION and fill in the form with the device details. There is no validity check of the parameters at this time. They will be validated when you attempt the first backup. The Filespace will also be created by the first backup if it does not already exist.

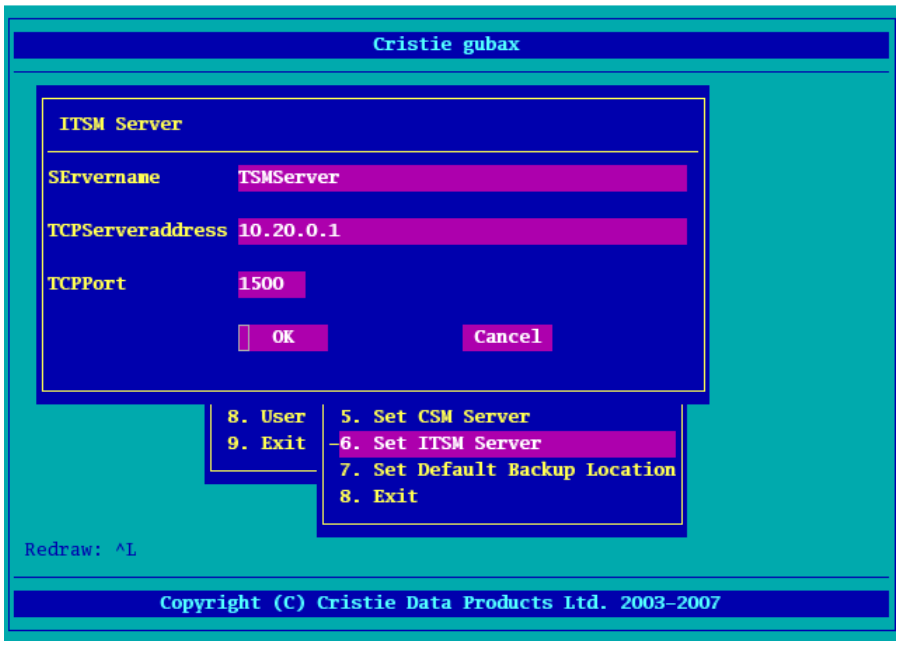
N.B. The node must be reserved for sole use by CBMR and may not be shared with any other process particularly the BA Client. The node must also be set up with the options

Backup Delete Allowed = Yes
Archive delete Allowed = Yes
Password Expires = 0



For an ITSM Backup Location, you also need to provide connection information for the TSM Server so that it can be accessed. This data is specified in dsm.sys. If you have not already created the file, you may do so by selecting SET ITSM SERVER from the menu. *If you do use this function it will overwrite any existing dsm.sys.* The file is created in the `/opt/tivoli/tsm/client/api/bin` directory.

The displayed form allows you to specify the basic parameters for connecting to the ITSM server over TCP/IP. The parameters are written into dsm.sys. Ensure that you use the same SErvername on this form as the ServerName on the ITSM Backup Location form.



Library Backup Location

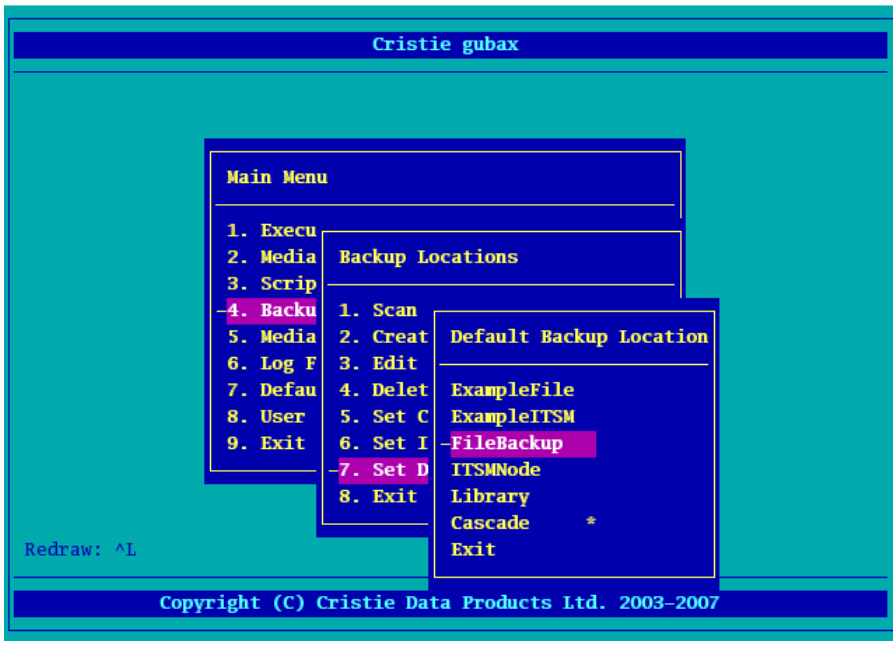
A locally attached tape library can be used as a Storage device. A CBMR library is defined as a drive and a number of tapes.You require the CBMR Library Support module to run this.

Cascaded Backup Location

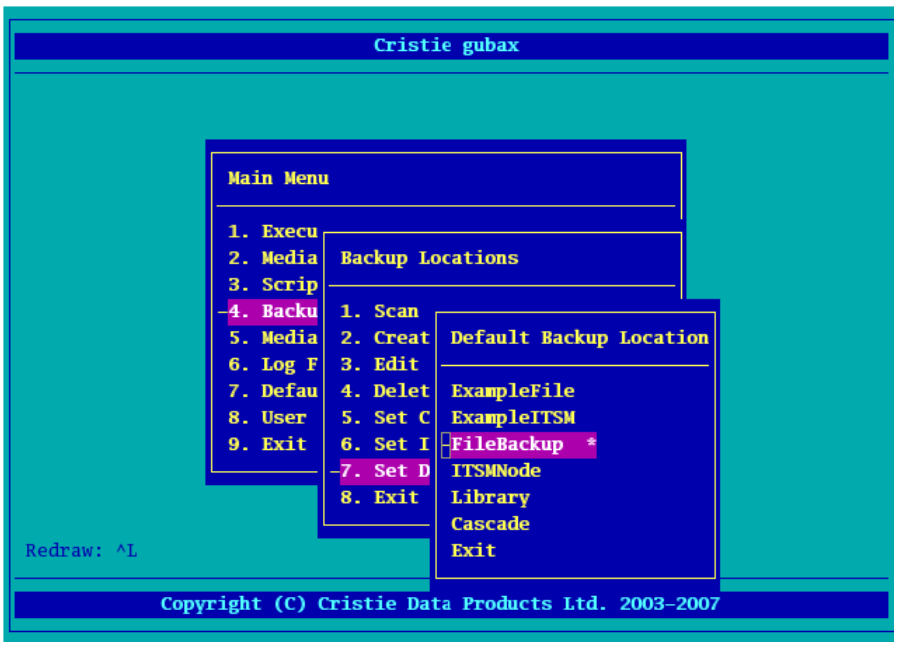
A cascaded Backup Location is a number of separate Backup Locations that are linked together so that when the first fills it continues to the second, and so on. Typically one could use this on tape drives or virtual tape drives. In order to create a Cascaded Backup Location you need first to create individual backup Locations that you can then cascade. This type is not particularly useful in a CBMR context where speed of recovery is important.

Default Backup Location

Once you have configured the backup location, you should set it as the default. Do this from the SET DEFAULT BACKUP LOCATION option on the Backup Locations menu. The device name marked with an asterisk (*) is the current default device.



Select the device that you want to be the Default and press Enter.



You may check that the selection has taken by selecting the Set Default Device menu again.

3.2 Disaster Recovery Backup

Files may be backed up from the command line program ubax or graphical program gubax.

3.2.1 ITSM Options

If you wish to backup to an ITSM Backup Location and need more than the basic parameters for connecting to your ITSM server, you should configure your ITSM API client outside gubax. To set up the ITSM API client, you should edit the ITSM `dsm.opt` (user options) and `dsm.sys` (system options) files. Note that the ITSM BA client may use separate files in the `/opt/tivoli/tsm/client/ba/bin/` directory. The default location for ITSM API client setup files is:

```
/opt/tivoli/tsm/client/api/bin/
```

The files should be edited to point to the ITSM server with additional parameters that you wish to use. In theory there should only be one dsm.sys file and there may be many dsm.opt files. The location of each may be controlled by environment variables. Hence you may use DSMI_CONFIG to identify the location of dsm.opt and DSMI_DIR to identify dsm.sys for the API calls.

3.2.2 Command Line Interface - ubax

To use the command line backup program ubax, first configure a storage device using gubax (see previous section - Creating a Backup Location). This only needs to be done once. Once the device has been configured it must be set as the default device; you can do this via gubax (see previous section - Creating a Backup Location) or by editing the configuration file `ubax.ini`.

NOTE: The Backup Location definitions are held in the file `/etc/cristie/devices.ini`. Each location definition starts with the symbolic name of the location e.g. `[ExampleLocation]`. The file `/etc/cristie/ubax.ini` must contain the symbolic name of the default location in the following form.
`DefStorageDev="ExampleLocation"`

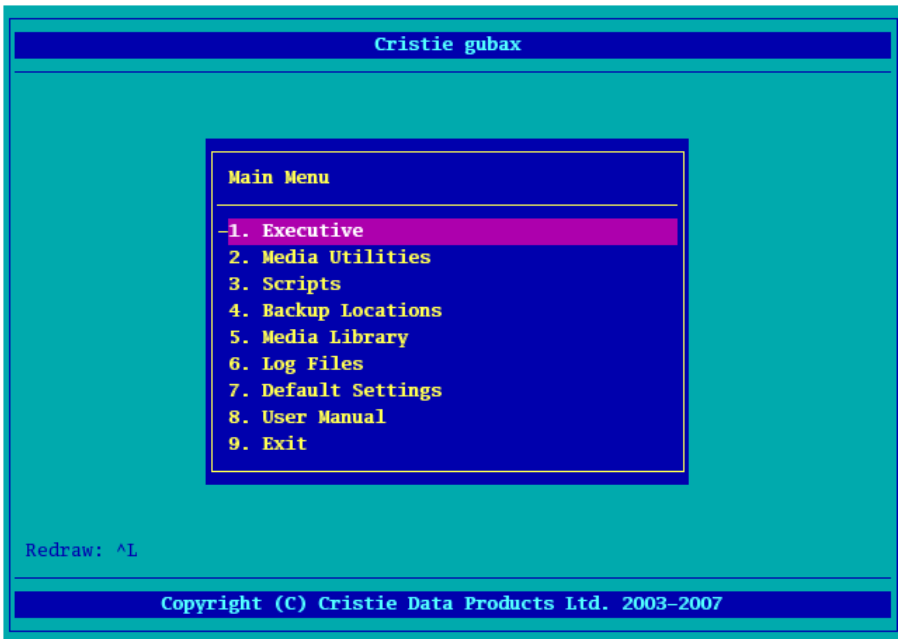
Once you have confirmed that the default location is correctly defined, you may back up the machine using the default script by using the following:

```
ubax -b /etc/cristie/scripts/cbmr.scp
```

There are many command line options available for ubax which are described in the manual page which is available by typing `man ubax`.

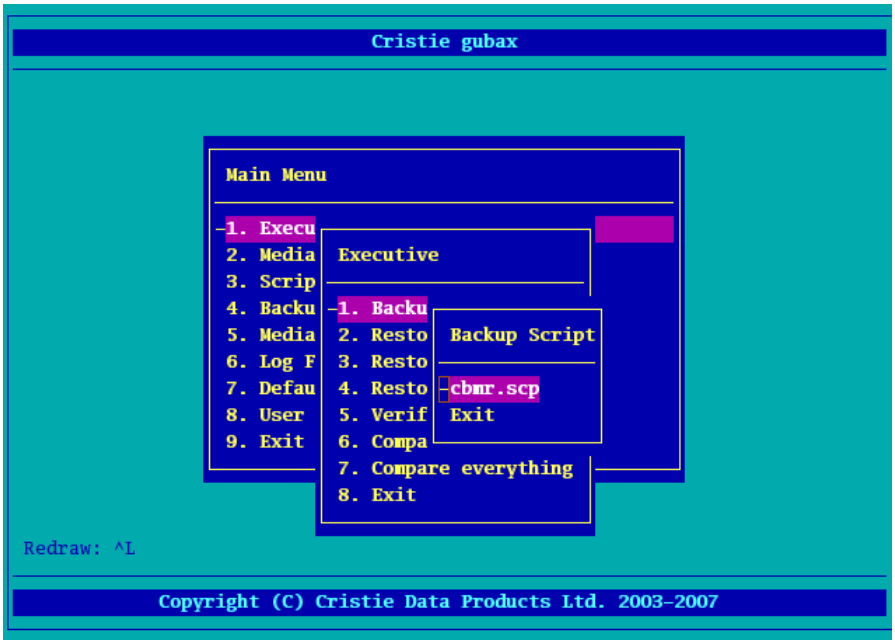
3.2.3 Graphical User Interface - gubax

To run gubax, type `gubax`. This will show the main menu.



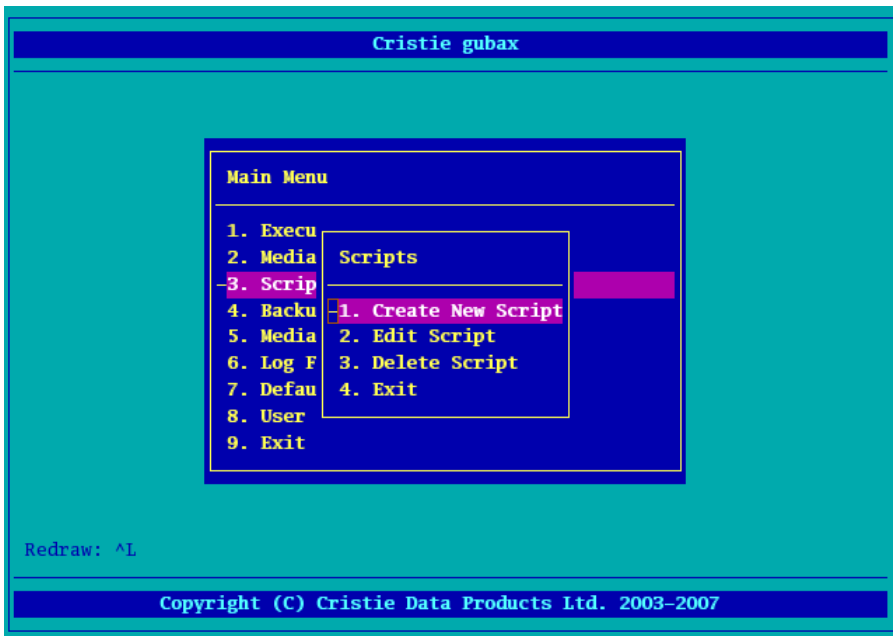
Before you start to backup you need to configure a Backup Location.

Once the Backup Location has been configured you may start the backup. Choose BACKUP from the Executive menu. A list of available scripts is shown.



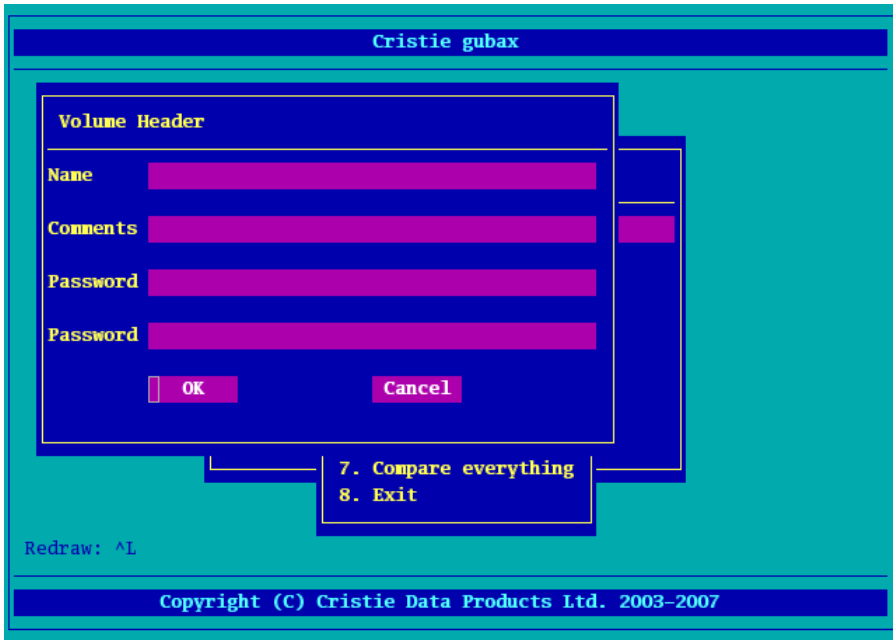
The default backup script `cbmr.scp` will backup all local filesystems. Note that if you wanted to include mounted CDROMs, for example, then they would need to be included specifically.

NOTE: All scripts are located in `/etc/cristie/scripts/`. You can create your own script with the GUI by selecting Scripts | Create New Script

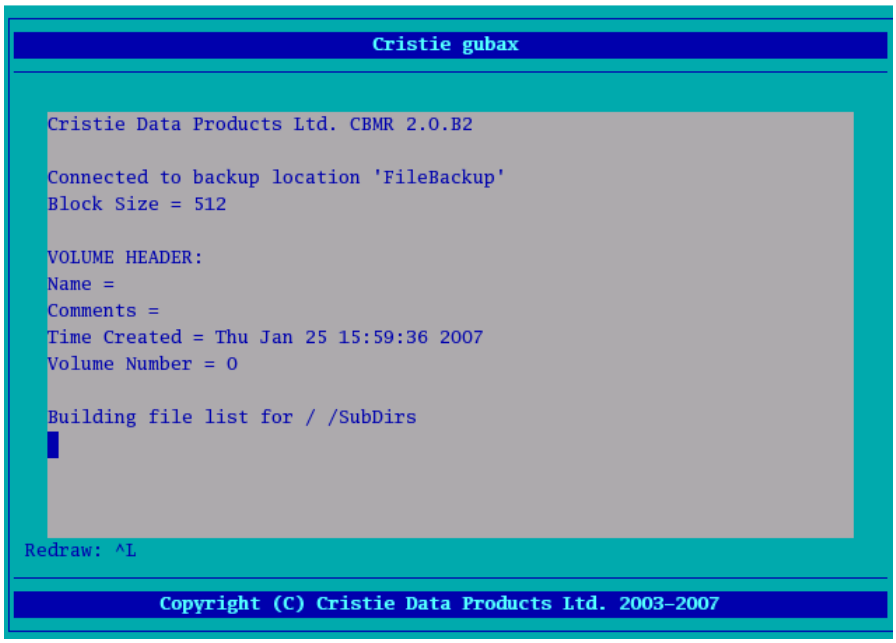


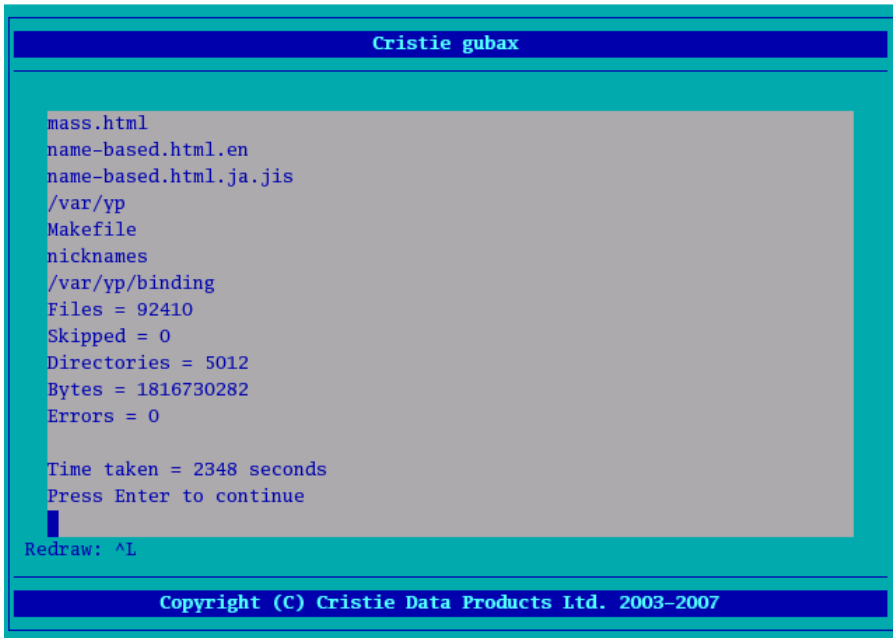
This opens a new script with the vi editor.

Select the required script and the backup will begin.



Volume Header information can be specified if you wish. After clicking **OK** the backup will start. The initial screen is shown below.


Cristie gubax
Cristie Data Products Ltd. CBMR 2.0.B2
Connected to backup location 'FileBackup'
Block Size = 512
VOLUME HEADER:
Name =
Comments =
Time Created = Thu Jan 25 15:59:36 2007
Volume Number = 0
Building file list for / /SubDirs
Redraw: ^L
Copyright (C) Cristie Data Products Ltd. 2003-2007



The backup completes with the message above. The information shown in both of the above is for logging level 4 (default).

There is a manual page for **gubax** available by typing `man gubax.`

Example Script

Scripts are held in /etc/cristie/scripts.

cbmr.scp will backup the whole machine and contains the following commands.

`#CBMR backup script` which means:

`Mode=Overwrite`	Overwrite the previous contents
`SNumber=0`	Use dataset 0
`/ /SubDirs`	Backup from / with all subdirectories.

Normally it is a waste of time and space to backup temporary files. These could be excluded by adding the line

```
/tmp /Xclude
```

after the `/ /Subdirs`.

Other features which may affect your backup are:

The parameter LocalFS=1 is set in ubax.ini and this ensures that the backup will only include local file systems; CD-ROM and network shares will be excluded.

The ubax command line option local_fs=0 may be used to override the LocalFS parameter at run time.

The ubax command line option `same_filesystem=1` will limit the backup to the same filesystem as each included directory and will not descend into mount points. (There is no equivalent setting in ubax.ini)

For more examples type `man ubax`.

3.3 Saving Configuration Data

Configuration information including details of disks and network cards must be saved for each machine to be recovered. This may be saved to a unique floppy disk for each machine, or to a central configuration store located on a network share. To save the configuration information for each machine, a command line program mkdisrec, or graphical interface gdisrec may be used.

3.3.1 Command Line Interface - mkdisrec

To use the command line configuration saving program, type mkdisrec followed by the required options. Some examples are shown here:

- *To save configuration information from a machine that boots using LILO to a unique floppy disk, use:*

```
mkdisrec -f
```

- *To save configuration information from a machine that boots using GRUB installed on /dev/hda to an NFS mounted share /nfs/configs, use:*

```
mkdisrec -b grub -d /dev/hda -c /nfs/configs
```

- *To save configuration information from a machine that boots using GRUB installed on /dev/sda to a floppy disk and backs up to a file device mounted using SMB at /mnt/backups, use:*

```
mkdisrec -b grub -d /dev/sda --filedev_mount_target=//10.0.0.36/cbmr
--filedev_mount_options="username=administrator,password=password"
```

- *To save the configuration information along with the backup use:*

the -a parameter e.g.

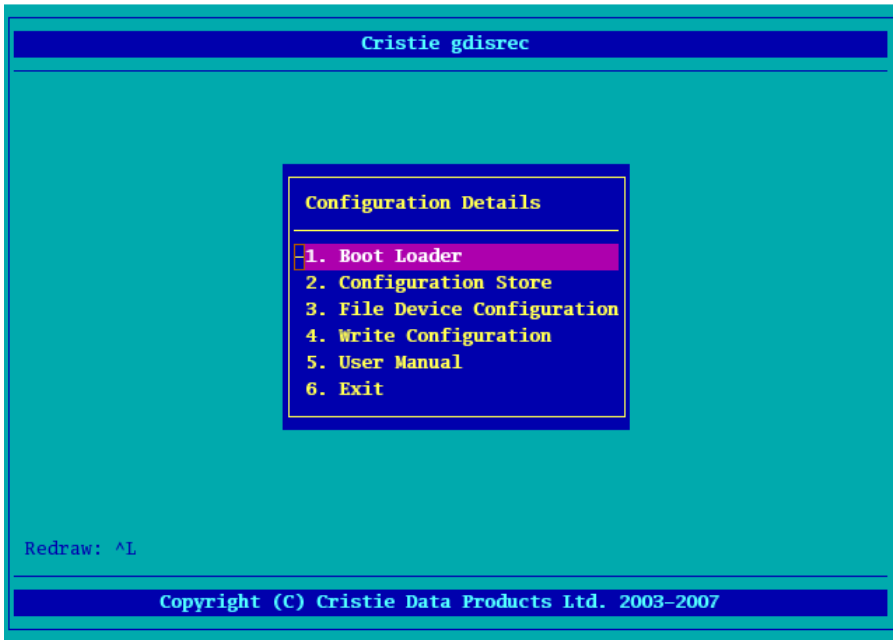
```
mkdisrec -a -b grub -d /dev/hda
```

This will cause the configuration data to be recreated and saved along with the backup data when the DR Backup is run. (There is no GUI equivalent to this parameter.)

There is a manual page for **mkdisrec** available by typing `man mkdisrec`.

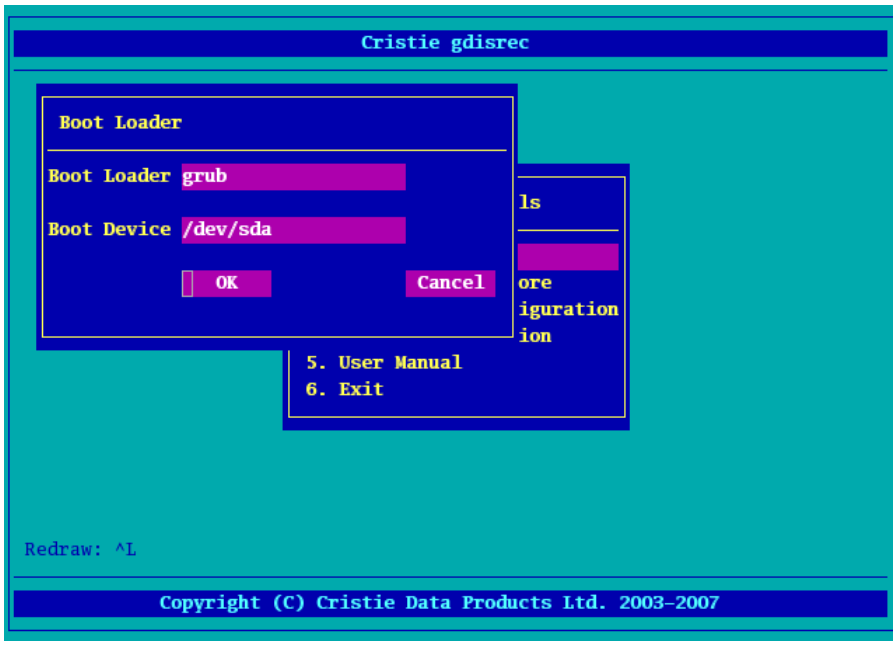
3.3.2 Graphical User Interface - gdisrec

The graphical utility **gdisrec** will run mkdisrec with the parameters that you specify. To run **gdisrec**, type `gdisrec` This will show the main menu.

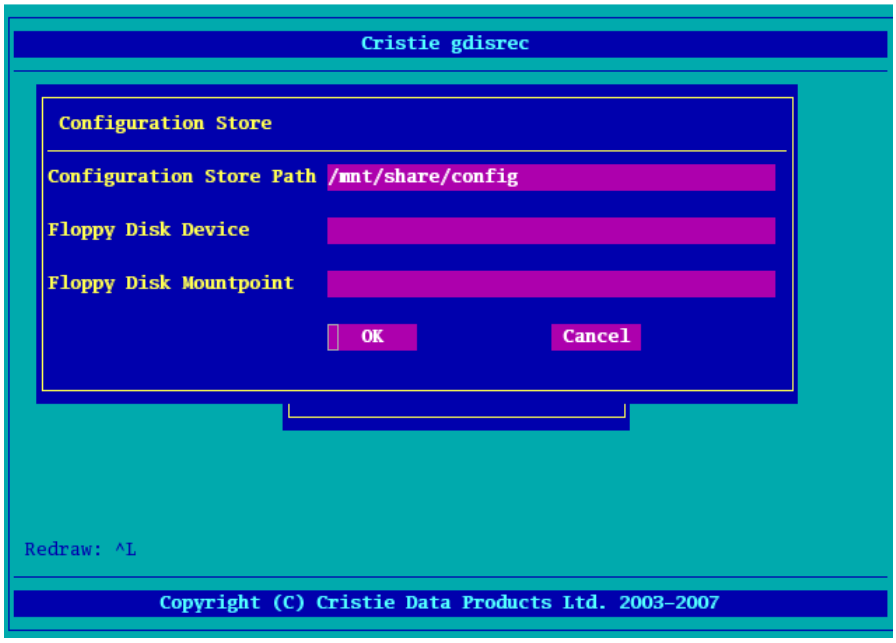


If you are using **lilo** as a boot loader you can ignore the BOOT LOADER menu item, if you are using **grub** you must select this menu and fill in the form with the name of the boot loader (grub) and the device where grub is installed (e.g. `/dev/sda` NOT `/dev/sda1` which is a partition).

There are many different bootloaders available but by far the most common is grub. CBMR defaults to using lilo because the boot location does not need to be specifed for it. The grub bootloader, on the other hand, must have the location of bootloader defined; there can be no default value. The name of the bootloader used by your machine will usually appear briefly when it is booted. Choosing the wrong bootloader will mean that the recovered machine will not boot.

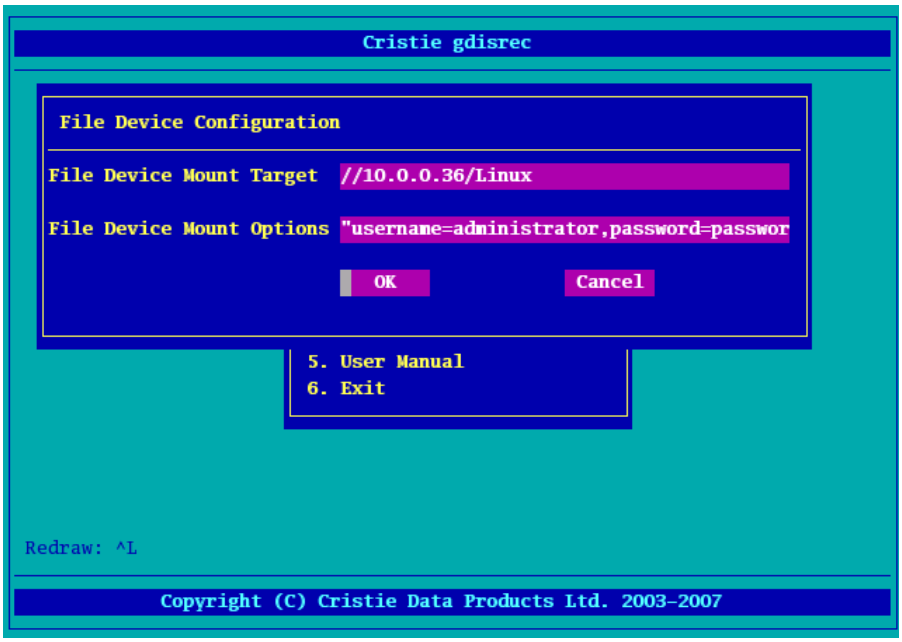


gdisrec gives you the option of storing configuration information either on floppy disk or in a central configuration store. If you want to use a unique floppy disk for each machine, you can ignore the CONFIGURATION STORE menu item, or leave it empty because it will then select the default floppy disk drive (/dev/fd0). If you want to use a central configuration store for all machines on your network, use this form.



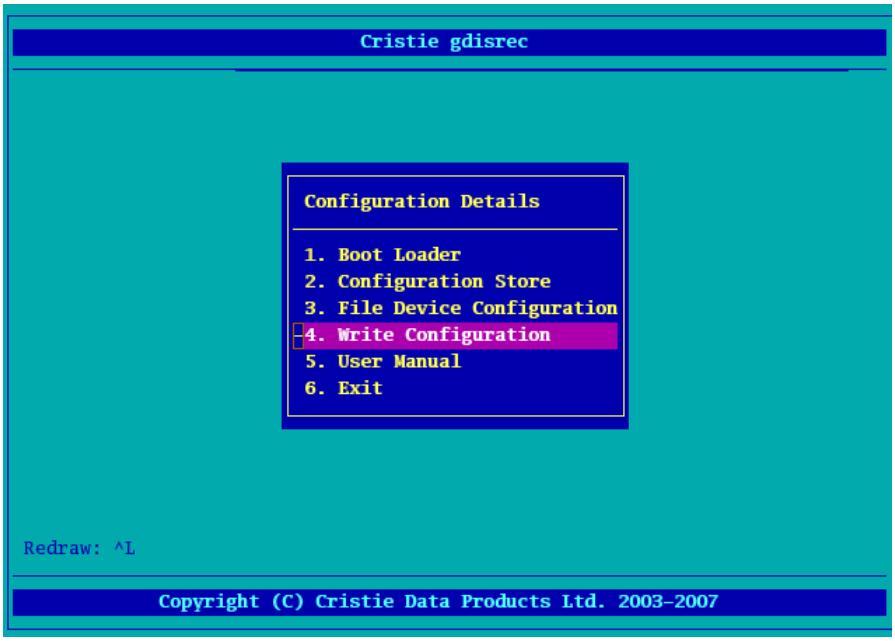
If you are using a File Backup Location, you must tell CBMR how to mount the share that leads to the device. CBMR can mount file devices using SMBFS or NFS. The share containing the file device should be mounted when creating configuration information.

NOTE: The File Device Mount Target must be identical to the current entry in the mount table. So if you have mounted the share using an IP address, then the definition below should also use the IP address. If you have mounted it with a hostname, then the definition below should also use the hostname. When you decide which method to use, remember that the definition may have to be used in a recovery environment that has no name service.

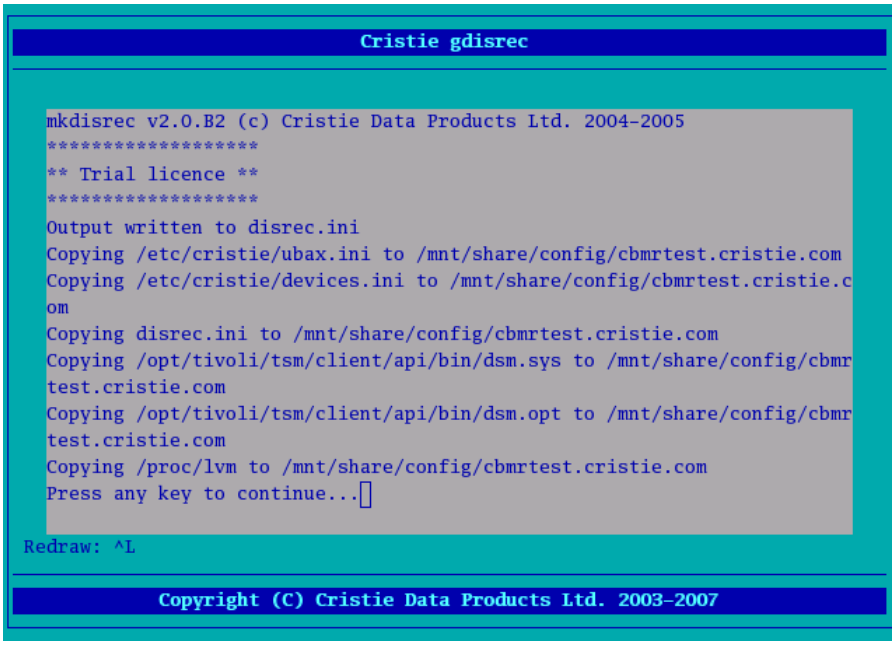


If you do not wish to reveal the password, omit the 'password' parameter and you will be prompted for it when it is needed. Once all the relevant fields have been filled in, click **OK**.

Now save the configuration information using the WRITE CONFIGURATION option from the main menu.



The configuration data will be written to the specified destination within a directory named with the hostname of the machine.



Continue by pressing any key.

There is no secure check on this operation so you will need to inspect the files just to ensure that the operation was indeed successful.

There is a manual page for gdisrec available by typing `man gdisrec`

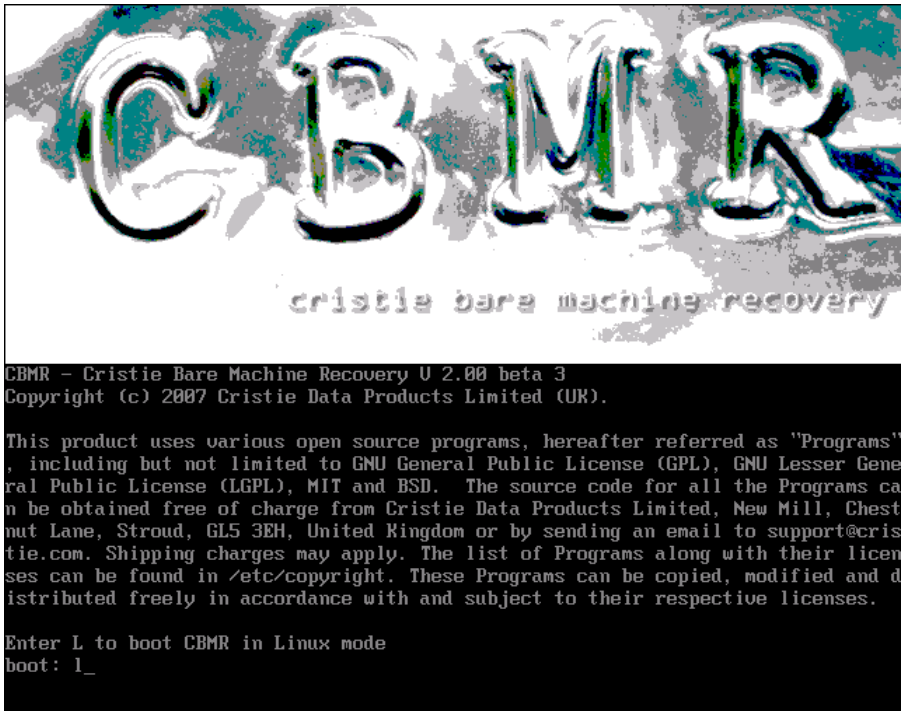
3.4 Housekeeping

In order to ensure that you can recover to the latest version of the operating system that was installed on you Linux machine, you must ensure that a fresh DR backup is performed every time the operating system files change. This is not always possible, so Cristie recommend that the DR Backup be performed once a week. However you should choose a period which reflects the rate of change in your own organization. Although the configuration data will change less frequently than the operating system, it is a wise precaution to update this regularly.

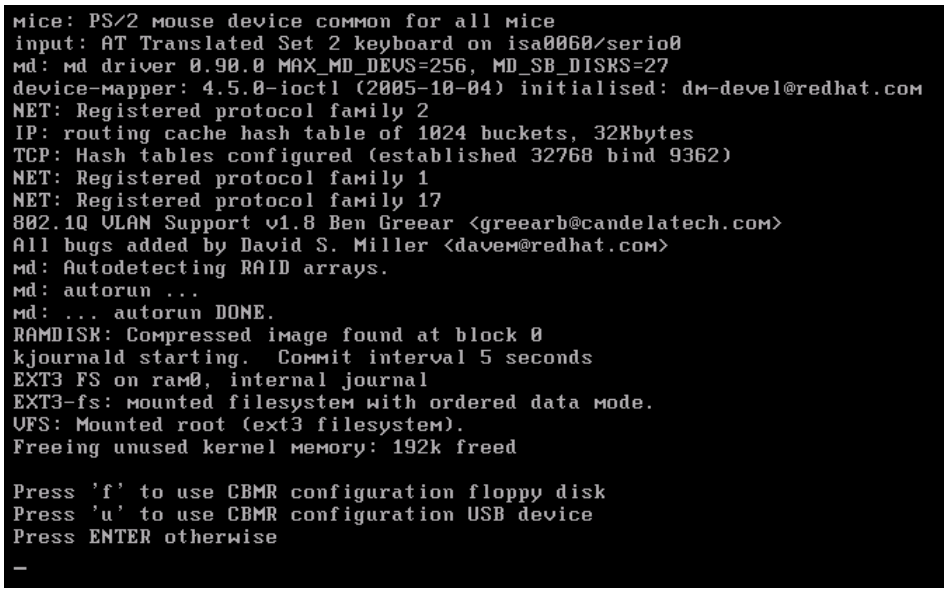
4 Performing a Recovery

When a machine has crashed it can be recovered using the CBMR bootable CDROM. This is the same CD from which you installed the software. You should ensure your machine's BIOS is set up to boot from CDROM. The process is in four or five stages:

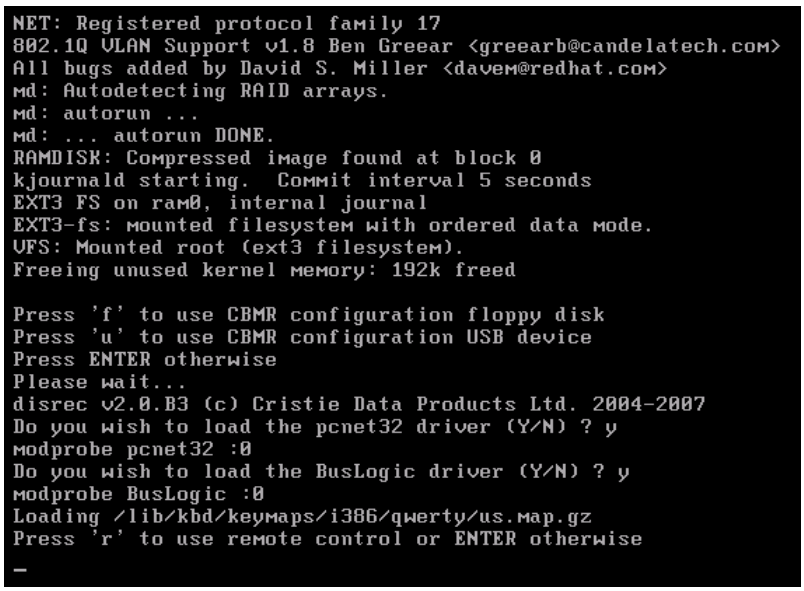
- Boot into Recovery OS
- Read Configuration Data
- Restore Files
- Load additional drivers (if necessary)
- Reboot into recovered OS


CBMR
cristie bare machine recovery
CBMR - Cristie Bare Machine Recovery V 2.00 beta 3
Copyright (c) 2007 Cristie Data Products Limited (UK).
This product uses various open source programs, hereafter referred as "Programs"
, including but not limited to GNU General Public License (GPL), GNU Lesser Gene
ral Public License (LGPL), MIT and BSD. The source code for all the Programs ca
n be obtained free of charge from Cristie Data Products Limited, New Mill, Chest
nut Lane, Stroud, GL5 3EH, United Kingdom or by sending an email to support@cris
tie.com. Shipping charges may apply. The list of Programs along with their licen
ses can be found in /etc/copyright. These Programs can be copied, modified and d
istributed freely in accordance with and subject to their respective licenses.
Enter L to boot CBMR in Linux mode
boot: l_

Press `l` when the CBMR logo appears.


mice: PS/2 mouse device common for all mice
input: AT Translated Set 2 keyboard on isa0060/serio0
md: md driver 0.90.0 MAX_MD_DEVS=256, MD_SB_DISKS=27
device-mapper: 4.5.0-ioctl (2005-10-04) initialised: dm-devel@redhat.com
NET: Registered protocol family 2
IP: routing cache hash table of 1024 buckets, 32Kbytes
TCP: Hash tables configured (established 32768 bind 9362)
NET: Registered protocol family 1
NET: Registered protocol family 17
802.1Q VLAN Support v1.8 Ben Greear <greearb@candelatech.com>
All bugs added by David S. Miller <davem@redhat.com>
md: Autodetecting RAID arrays.
md: autorun ...
md: ... autorun DONE.
RAMDISK: Compressed image found at block 0
kjournald starting. Commit interval 5 seconds
EXT3 FS on ram0, internal journal
EXT3-fs: mounted filesystem with ordered data mode.
VFS: Mounted root (ext3 filesystem).
Freeing unused kernel memory: 192k freed
Press 'f' to use CBMR configuration floppy disk
Press 'u' to use CBMR configuration USB device
Press ENTER otherwise

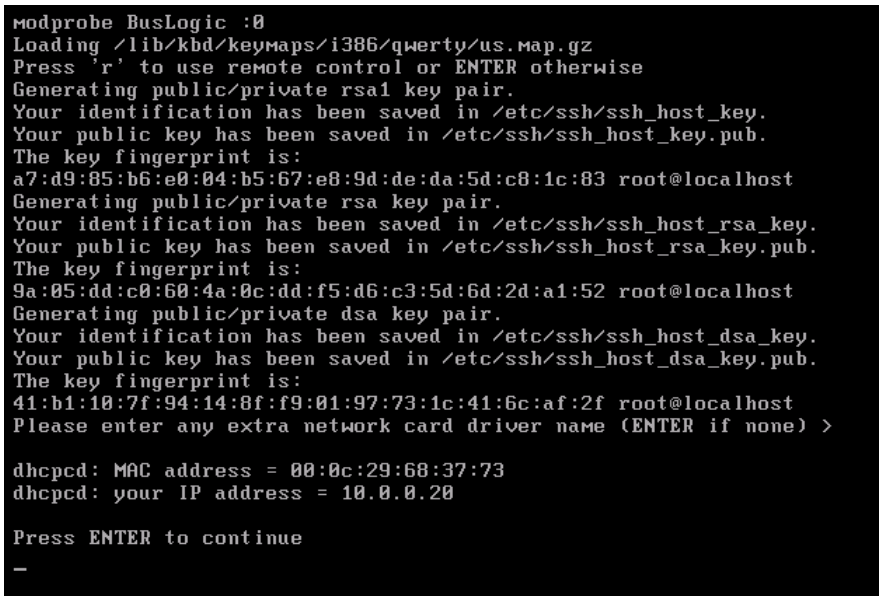
If your configuration information is stored on a floppy disk you can pre-load the configuration data at this point by pressing `f`. Otherwise press **ENTER** so that you can load the data from a network share.


NET: Registered protocol family 17
802.1Q VLAN Support v1.8 Ben Greear <greearb@candelatech.com>
All bugs added by David S. Miller <davem@redhat.com>
md: Autodetecting RAID arrays.
md: autorun ...
md: ... autorun DONE.
RAMDISK: Compressed image found at block 0
kjournald starting. Commit interval 5 seconds
EXT3 FS on ram0, internal journal
EXT3-fs: mounted filesystem with ordered data mode.
VFS: Mounted root (ext3 filesystem).
Freeing unused kernel memory: 192k freed
Press 'f' to use CBMR configuration floppy disk
Press 'u' to use CBMR configuration USB device
Press ENTER otherwise
Please wait...
disrec v2.0.B3 (c) Cristie Data Products Ltd. 2004-2007
Do you wish to load the pcnet32 driver (Y/N) ? y
modprobe pcnet32 :0
Do you wish to load the BusLogic driver (Y/N) ? y
modprobe BusLogic :0
Loading /lib/kbd/keymaps/i386/qwerty/us.map.gz
Press 'r' to use remote control or ENTER otherwise

In either case, the program will first detect storage and network devices and ask you to confirm whether they should be loaded. After this the program offers the opportunity to use a 'remote control' option.

Remote Control

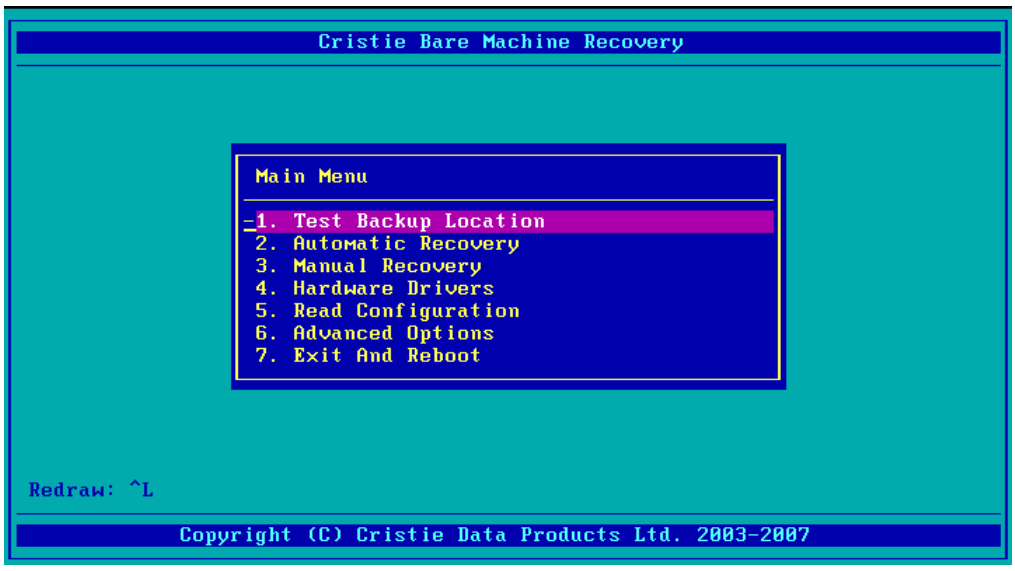
You may set up the recovering machine so that the operations from the main menu can be run from a remote machine. Pressing `r` when prompted takes you into the setup which will allocate and identify the ip address of the interface if DHCP is available on the network.


modprobe BusLogic :0
Loading /lib/kbd/keymaps/i386/qwerty/us.map.gz
Press 'r' to use remote control or ENTER otherwise
Generating public/private rsa1 key pair.
Your identification has been saved in /etc/ssh/ssh_host_key.
Your public key has been saved in /etc/ssh/ssh_host_key.pub.
The key fingerprint is:
a7:d9:85:b6:e0:04:b5:67:e8:9d:de:da:5d:c8:1c:83 root@localhost
Generating public/private rsa key pair.
Your identification has been saved in /etc/ssh/ssh_host_rsa_key.
Your public key has been saved in /etc/ssh/ssh_host_rsa_key.pub.
The key fingerprint is:
9a:05:dd:c0:60:4a:0c:dd:f5:d6:c3:5d:6d:2d:a1:52 root@localhost
Generating public/private dsa key pair.
Your identification has been saved in /etc/ssh/ssh_host_dsa_key.
Your public key has been saved in /etc/ssh/ssh_host_dsa_key.pub.
The key fingerprint is:
41:b1:10:7f:94:14:8f:f9:01:97:73:1c:41:6c:af:2f root@localhost
Please enter any extra network card driver name (ENTER if none) >
dhcpcd: MAC address = 00:0c:29:68:37:73
dhcpcd: your IP address = 10.0.0.20
Press ENTER to continue

Running a remote terminal emulator with SSH capability will allow you to connect to the recovering machine on port 22. The login name is `root` and the password is `root`. Once you have successfully logged in you have access to a bash shell. Typing `dr` will activate a GUI.

GUI Main Menu

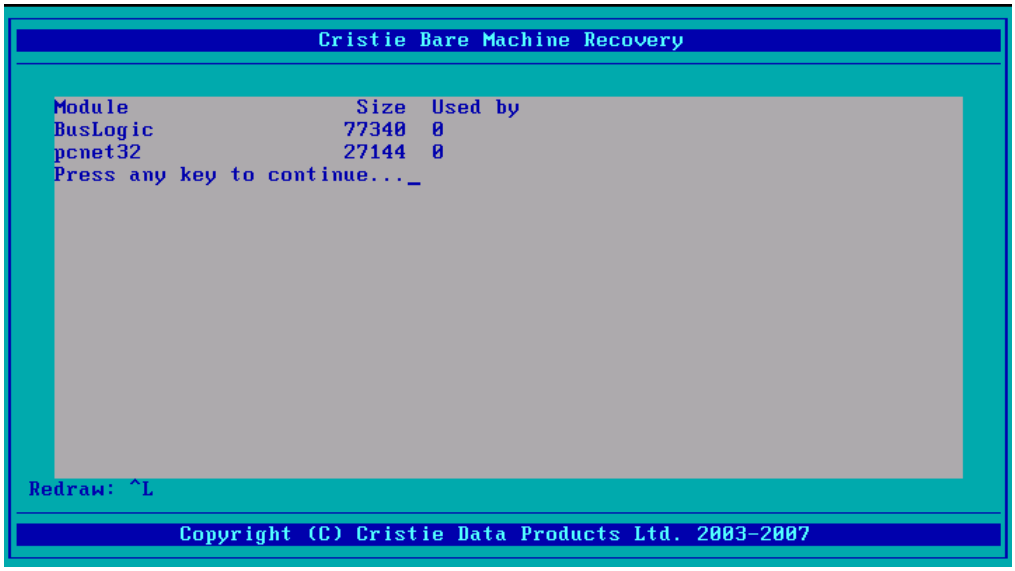
Whether or not you have activated remote control, the GUI Main Menu will be displayed.



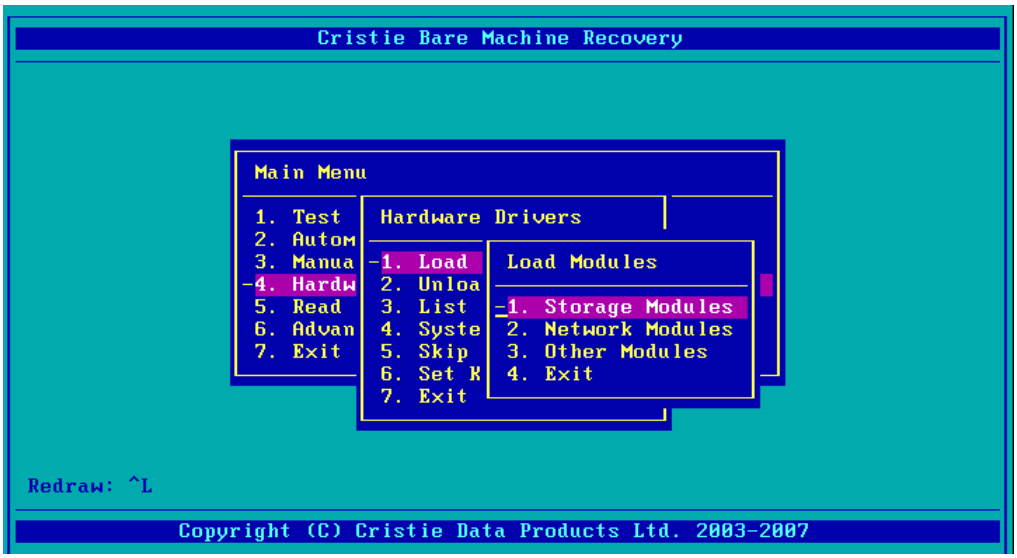
Check Loaded Drivers

Before you can connect to a network and before you can write data to your disk storage, you need to ensure that the correct drivers are loaded for you hardware.

The Linux recovery OS will attempt to load drivers for devices that it can recognise, during the boot process and before the GUI is displayed. You can check which drivers have been loaded by selecting LIST LOADED MODULES from the HARDWARE DRIVERS menu.


Cristie Bare Machine Recovery
Module Size Used by
BusLogic 77340 0
pcnet32 27144 0
Press any key to continue...
Redraw: ^L
Copyright (C) Cristie Data Products Ltd. 2003-2007

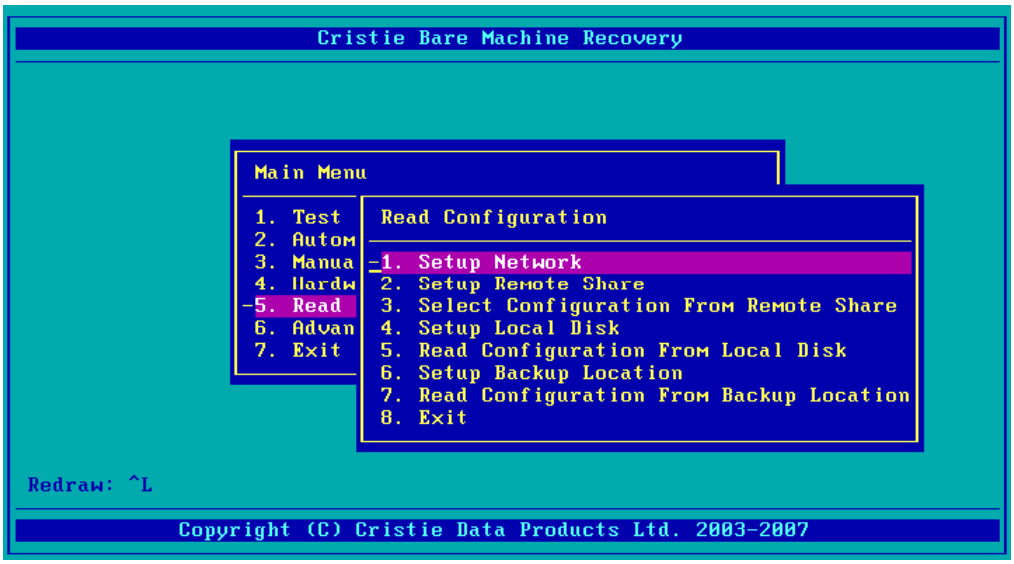
If any of the drivers are missing, you can load individual drivers manually by using the LOAD MODULES menu.



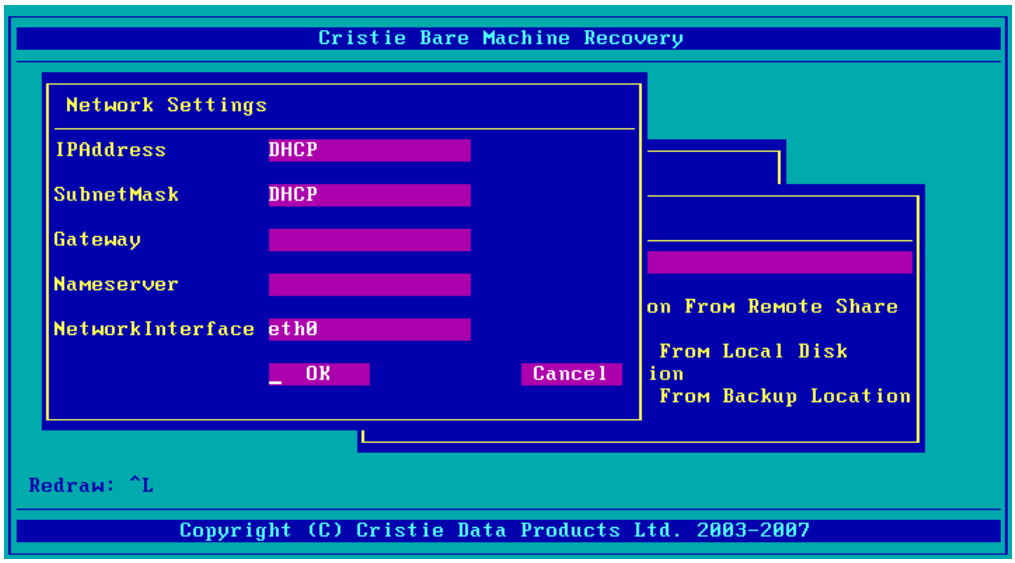
Choose the appropriate driver for your hardware from the list.

4.1 Connect to Network

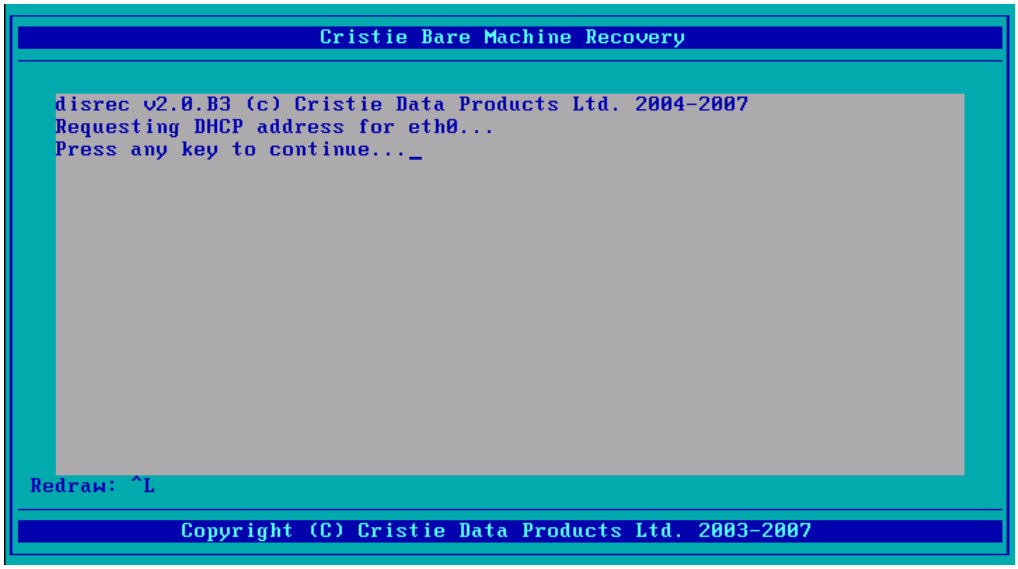
Before you can access the configuration or backup data over the network, we must set up the NIC on a specific interface. Begin this process by selecting SETUP NETWORK from the Read Configuration menu.



The form displayed allows you to enter all of the data needed to establish as many network connections as you have NICs on the computer. If DHCP is available on the network, you can specify DHCP in both the IPAddress and the SubnetMask. Your DHCP server should then supply not only the IP address and subnet mask, but also the gateway and DNS details. If you omit the NetworkInterface then it will default to eth0.

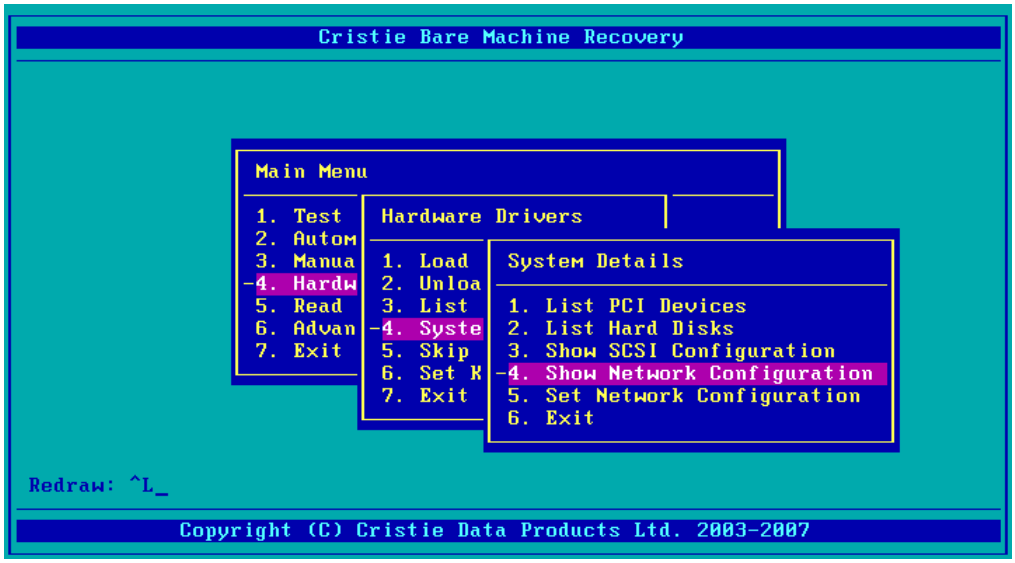


After clicking OK you will see the following


Cristie Bare Machine Recovery
disrec v2.0.B3 (c) Cristie Data Products Ltd. 2004-2007
Requesting DHCP address for eth0...
Press any key to continue...
Redraw: ^L
Copyright (C) Cristie Data Products Ltd. 2003-2007

NOTE: When you have multiple NICs in the server, the cards are not necessarily discovered in the same order as they were on the host operating system. Therefore you may need to physically check which NICS are bound to which interface.

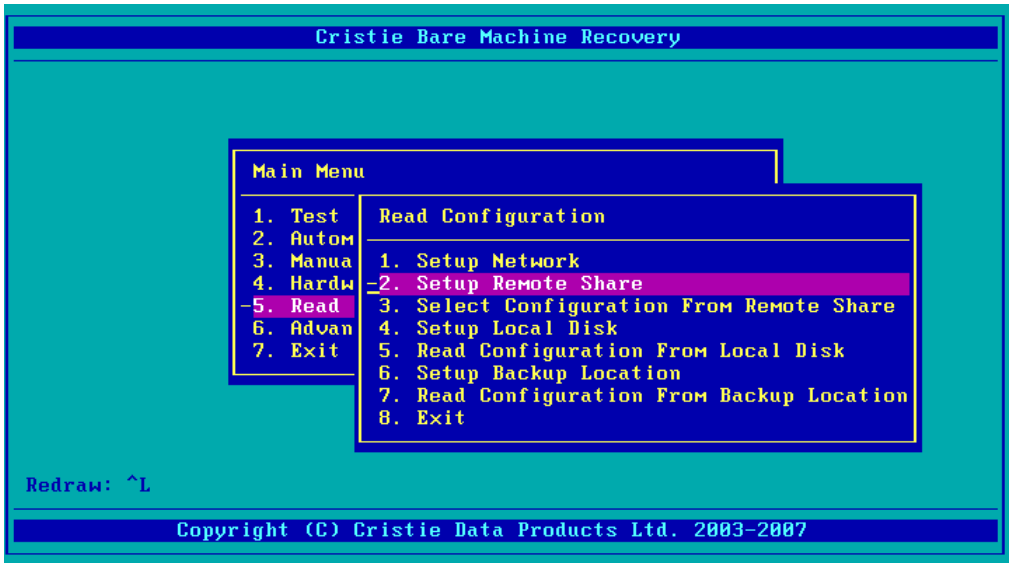
If you need to check that the interface has been set correctly, you can either use the GUI HARDWARE DRIVERS | SYSTEM DETAILS | SHOW NETWORK CONFIGURATION



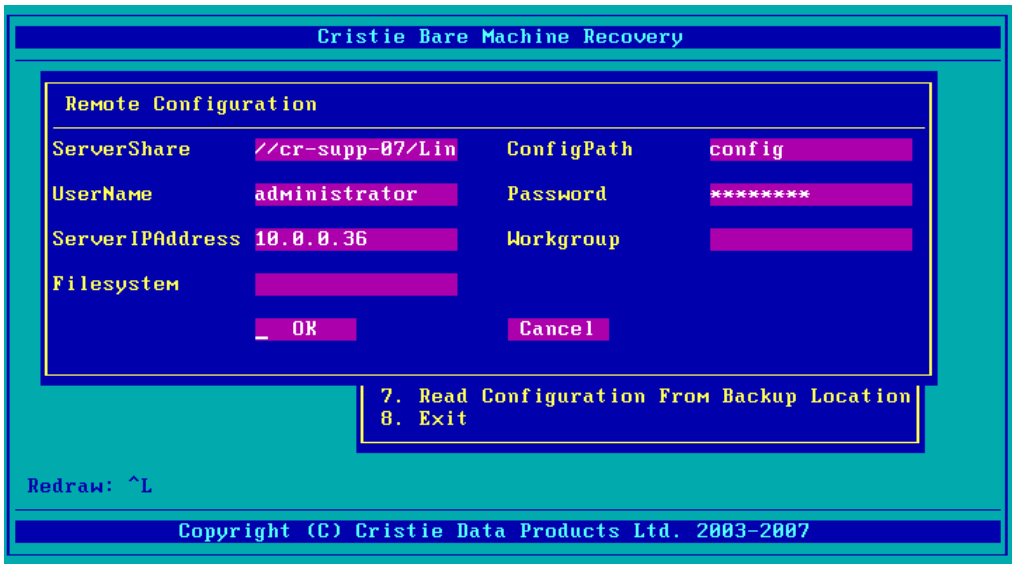
or from a separate virtual terminal (`Alt-F2`) type `ifconfig` and this will list all of the interfaces. You can see the routing table by typing `route -n`. Return to the GUI by switching virtual terminals again (`Alt-F1`).

4.2 Read Configuration Data

If you are using a unique floppy disk for each machine, you may skip this section because the configuration data has already been loaded. To recover the data from a network share, you must first connect to the central configuration store and retrieve the configuration information for your machine. You should tell the recovering machine where to find the configuration information. A form is provided in the GUI to fill in the information needed to make this connection which you may find under READ CONFIGURATION DATA | SETUP REMOTE SHARE.



The example shows a system that uses a SMBFS mounted central configuration store.



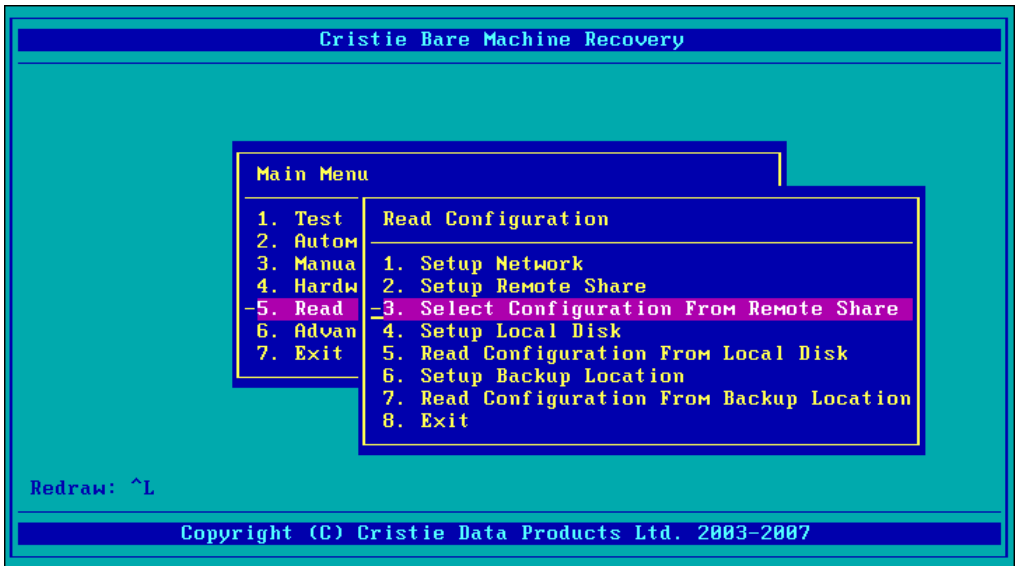
The fields have the following significance when using a smbfs share on a Windows machine.

Field	Value	Comments
ServerShare	//cr-supp-07/Linux	//<hostname>/<sharename> you can replace the <hostname> with the IP address of the machine.
Config path	/config	Folder within share (if required)
Username	administrator	Valid user with Local Administrator rights for Workgroup below
Password	xxxxxxxx	Valid password for Username
ServerIPAddress	10.0.0.36	IP address of the machine. If IP address has been used instead of <hostname> in ServerShare, this field can be left blank.
Workgroup	cr-supp-07	Domain/Workgroup/machine name – usually machine name for a user that is a Local Administrator. There are occasions when it can be omitted.
Filesystem	smbfs	'nfs' or 'smbfs'. Use smbfs for cifs.

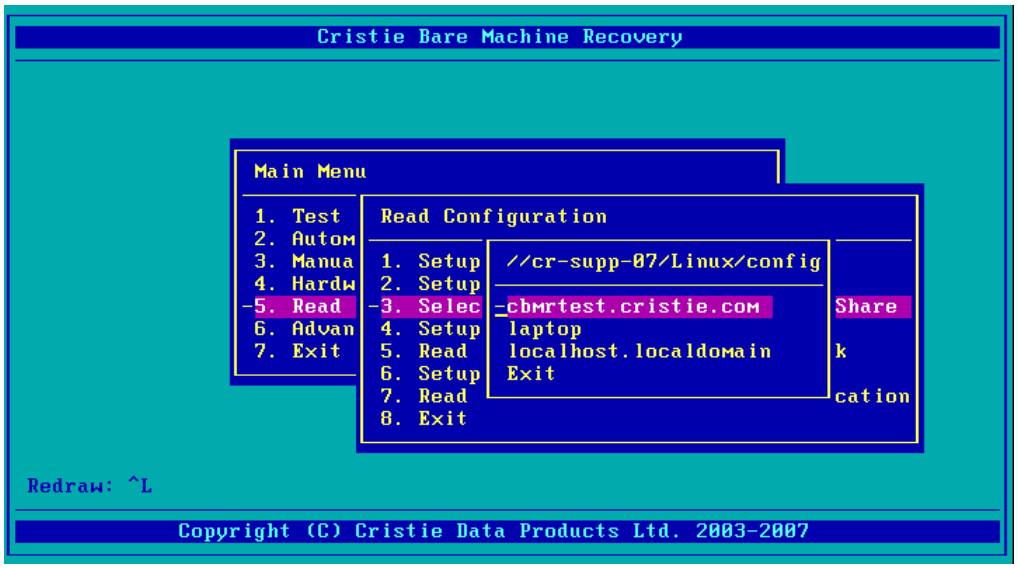
The fields have the following significance when using a nfs share.

Field	Value	Comments
ServerShare	10.0.0.36:/Linux	ipaddress:/<sharename>
Config path	/config	Folder within share (if required)
Filesystem	nfs	'nfs' or 'smbfs'

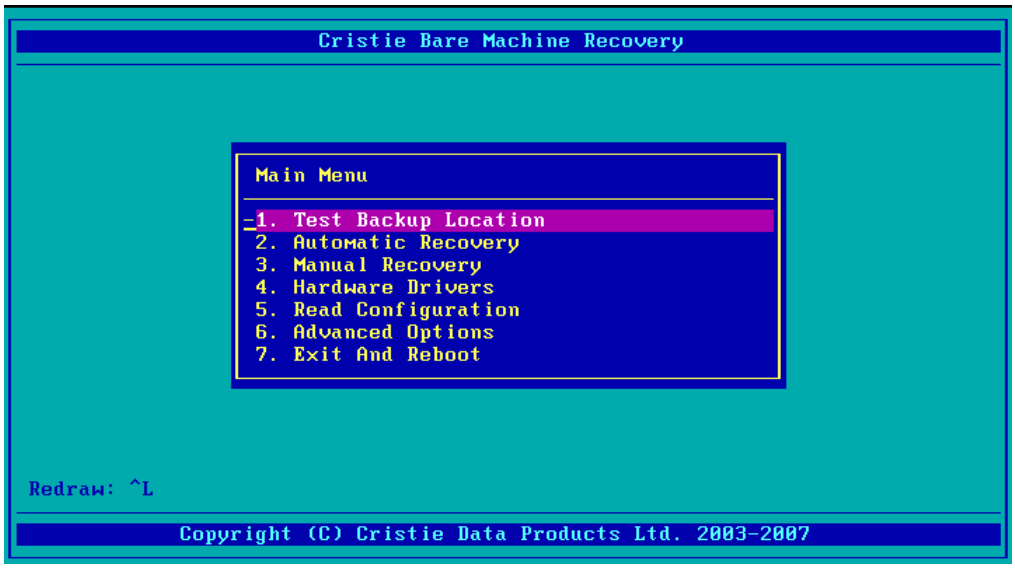
After clicking **OK** select SELECT CONFIGURATION from the menu below.



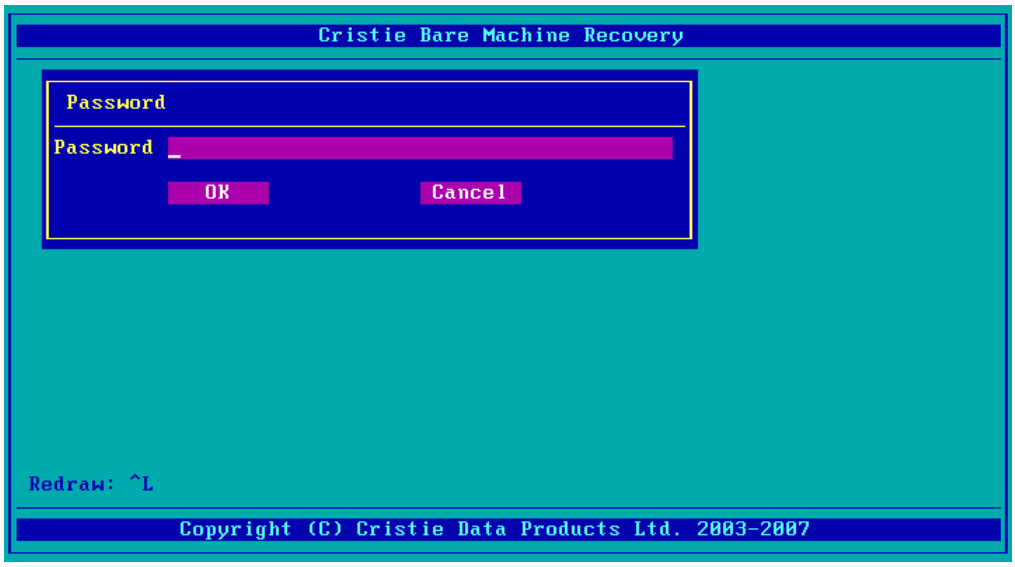
Provided that the supplied credentials are accepted by the machine that offers the share, then you will be shown a list of the configurations that are available. Select the appropriate one from the list and press **Enter**.



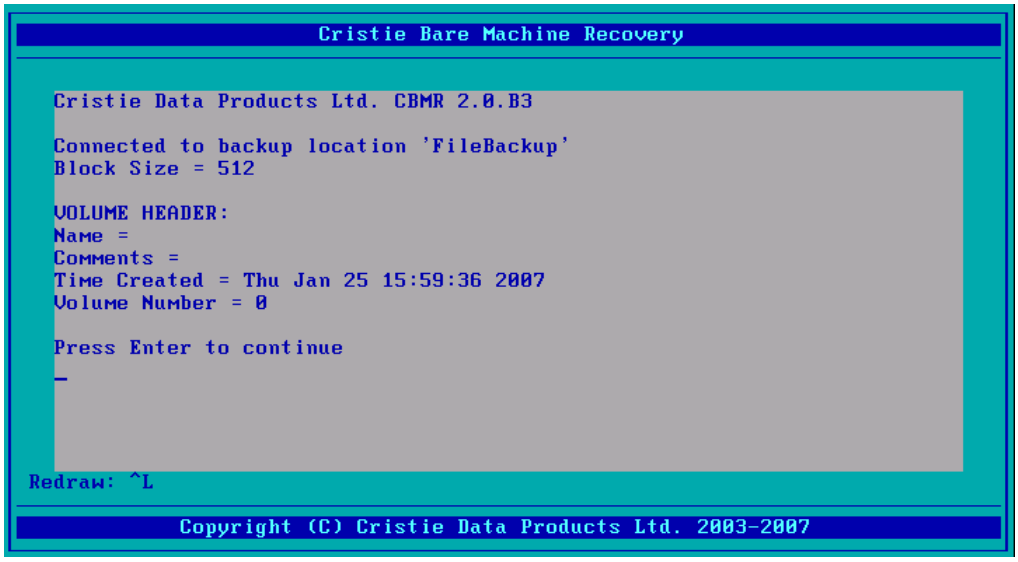
The configuration data has now been loaded. Before starting to recover the machine, choose TEST BACKUP DEVICE from the main menu.



This will test the connection to the backup device asking for a Media Password.



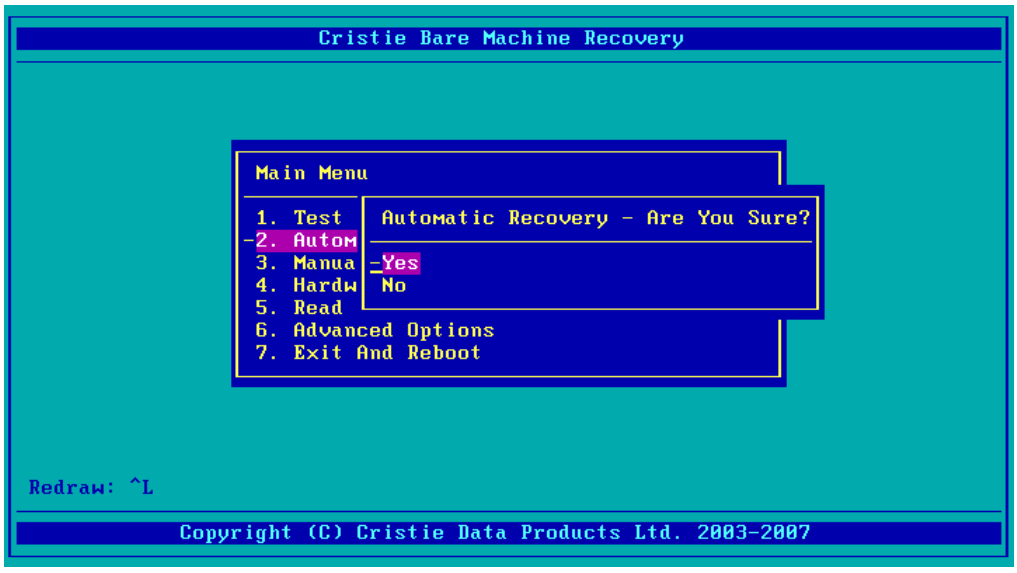
Enter the Media Password if you are using one. Once you click on **OK** the program will attempt to connect to the Backup Location. If the connection is successful, information from the Volume Header on the backup device will be shown.


Cristie Bare Machine Recovery
Cristie Data Products Ltd. CBMR 2.0.B3
Connected to backup location 'FileBackup'
Block Size = 512
VOLUME HEADER:
Name =
Comments =
Time Created = Thu Jan 25 15:59:36 2007
Volume Number = 0
Press Enter to continue
Redraw: ^L
Copyright (C) Cristie Data Products Ltd. 2003-2007

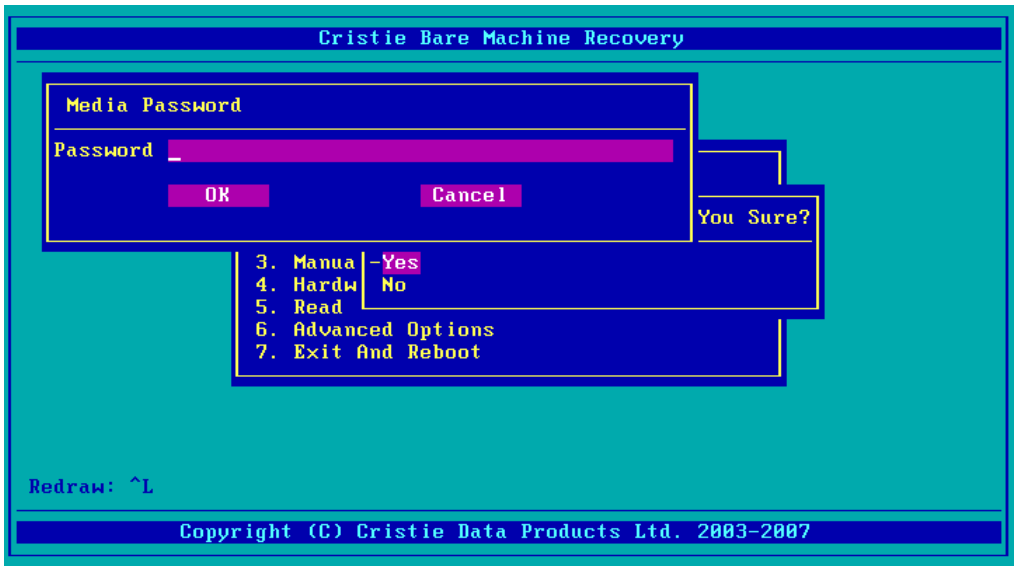
Press **Enter** and you will be returned to the Main Menu.

4.3 Restore DR Backup

Once this test is successful, choose Automatic Recovery from the Main menu. This will recover your system.

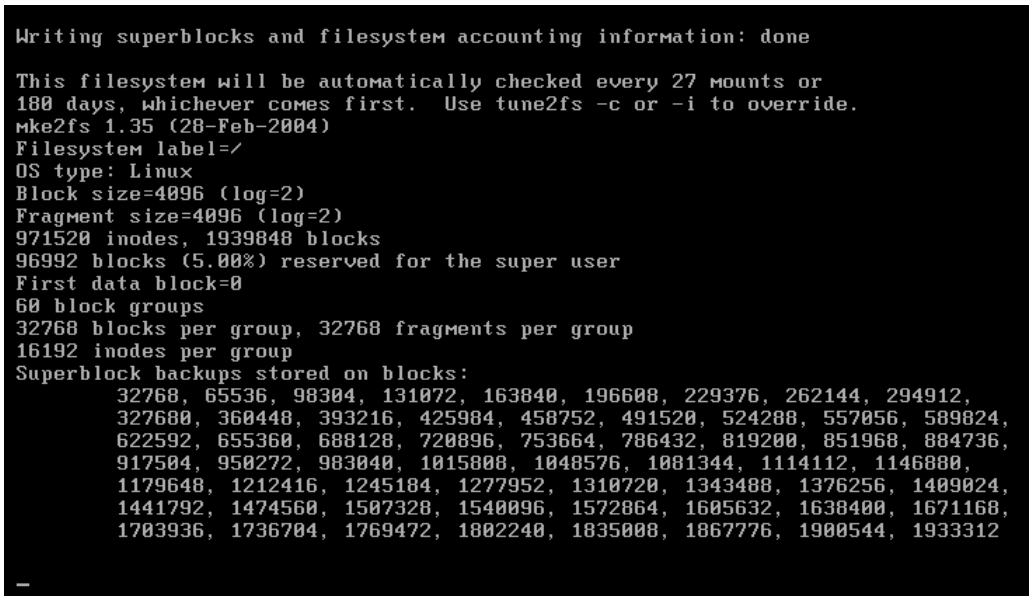


Select YES to start the recovery.



Enter the Media Password if you are using is one. Click on **OK**.

The process will begin by recreating the disks from the original partition information.



After partitioning the disks they will be formatted and then the files will be restored from the DR Backup.

```
fd-limits.html.ja.jis
footer.html
header.html
index.html.en
index.html.ja.jis
ip-based.html
mass.html
name-based.html.en
name-based.html.ja.jis
/mnt/slash/var/yp
Makefile
nicknames
/mnt/slash/var/yp/binding
Files = 92409
Skipped = 74
Directories = 5012
Bytes = 1816729983
Errors = 0

Time taken = 3175 seconds
Module mptfc for kernel 2.4.20-8 not found.
Enter D to copy this module from a removable device
Enter the directory path if this module is available on this machine
Press ENTER to skip this module.
_
```

When the recovery is complete, you will see a summary of the files and directories that were copied. The same data is recorded in recovery.log.

Dissimilar Hardware

If you are recovering to dissimilar hardware, you may also see the filenames of storage driver modules that are missing from the kernel. These need to be incorporated into a new kernel and therefore need to be supplied. Each missing module is identified separately and you have the opportunity to load them individually. CBMR will only check for the drivers of storage modules. NIC drivers may be loaded once the system has been recovered. You may find that some of the storage device modules that are missing are not essential to the operation of the system, in which case they can be ignored.

```
rd.K6LjYD/lib/mptscsih.o'
'/lib/modules/2.4.20-8/./kernel/drivers/scsi/BusLogic.o' -> '/tmp/initrd.K6LjYD/
lib/BusLogic.o'
'/lib/modules/2.4.20-8/./kernel/fs/jbd/jbd.o' -> '/tmp/initrd.K6LjYD/lib/jbd.o'
'/lib/modules/2.4.20-8/./kernel/fs/ext3/ext3.o' -> '/tmp/initrd.K6LjYD/lib/ext3.
o'
Loading module scsi_mod.o
Loading module sd_mod.o
Loading module mptbase.o
Loading module mptscsih.o
Loading module BusLogic.o
Loading module jbd.o
Loading module ext3.o
/boot/vmlinuz-2.4.20-8
Installation finished. No error reported.
This is the contents of the device map /boot/grub/device.map.
Check if this is correct or not. If any of the lines is incorrect,
fix it and re-run the script 'grub-install'.

# this device map was generated by anaconda
(fd0)     /dev/fd0
(hd0)     /dev/sda
/mnt/slash/boot unmounted
/mnt/slash/ unmounted
Press any key to continue_
```

When the missing drivers have been included, a new initial RAMdisk is built. Once that is completed, press any key to return you to the Main Menu.

NOTE: The new initial RAMdisk will be built even if you are recovering to the same hardware. The process may be controlled via the configuration file disrec.ini. In the [DissimilarHardware] section of this file the parameter DissimilarHardwareSupport="1" is the default setting. If you change this to DissimilarHardwareSupport="0" then there will be no rebuild of the initial RAMdisk.

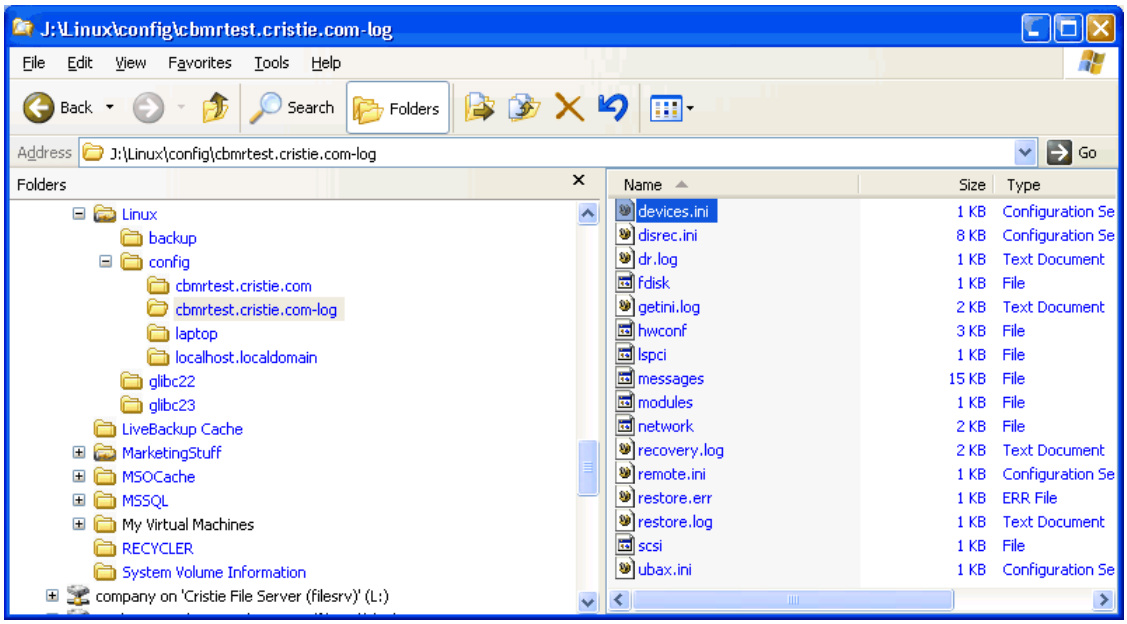
4.4 Save Log Files

4.4.1 Saving Log Files

There is a small chance that an error may occur when you reboot the computer. If that is the case and the cause is not immediately apparent, you may need to report the failure to Cristie. They will want to have as much information as possible to help diagnose the cause of the problem. Therefore it is recommended that before you complete the recovery, you copy all of the log files that have been created thus far onto floppy disk or network share. This may be done via Advanced Options | Log Files.

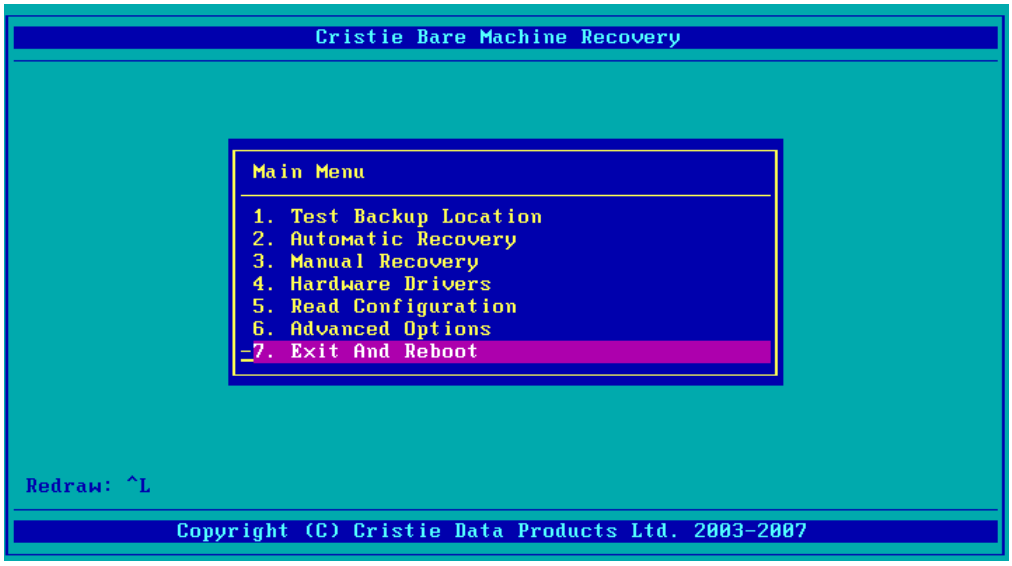
Menu items 5 and 6 will copy the logs from /usr/local/log and /var/log and record other data to help with problem diagnosis.

The following screenshot shows the files saved on a Samba share. Note the naming of the folder containing the log files.

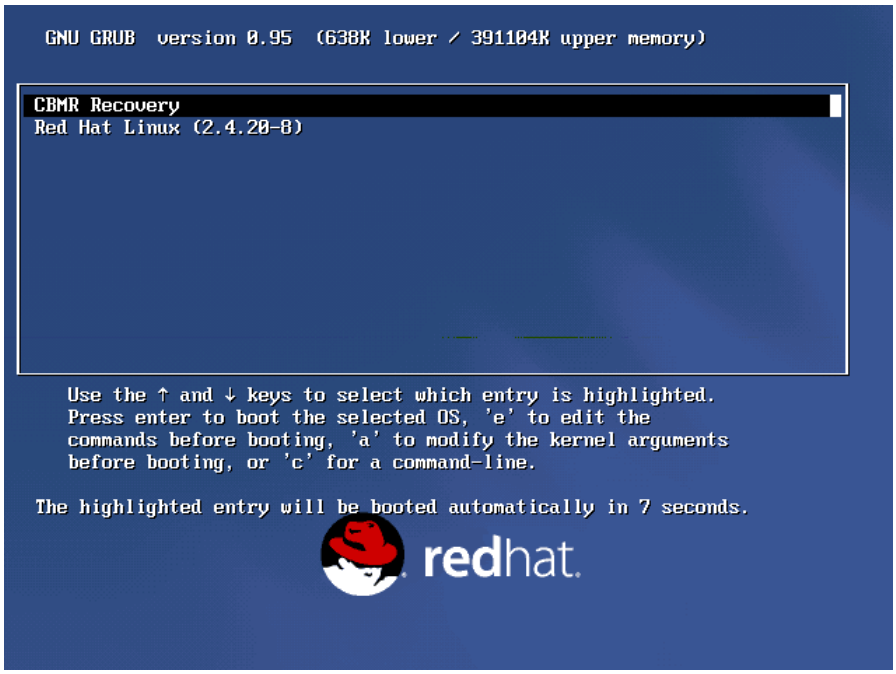


Once you have saved the log files return to the Main Menu.

4.5 Reboot to Recovered OS

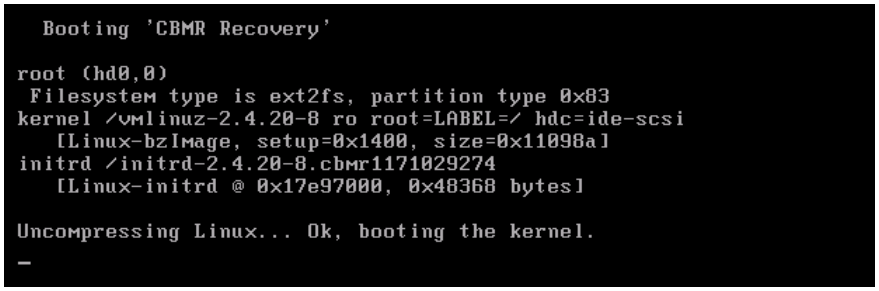


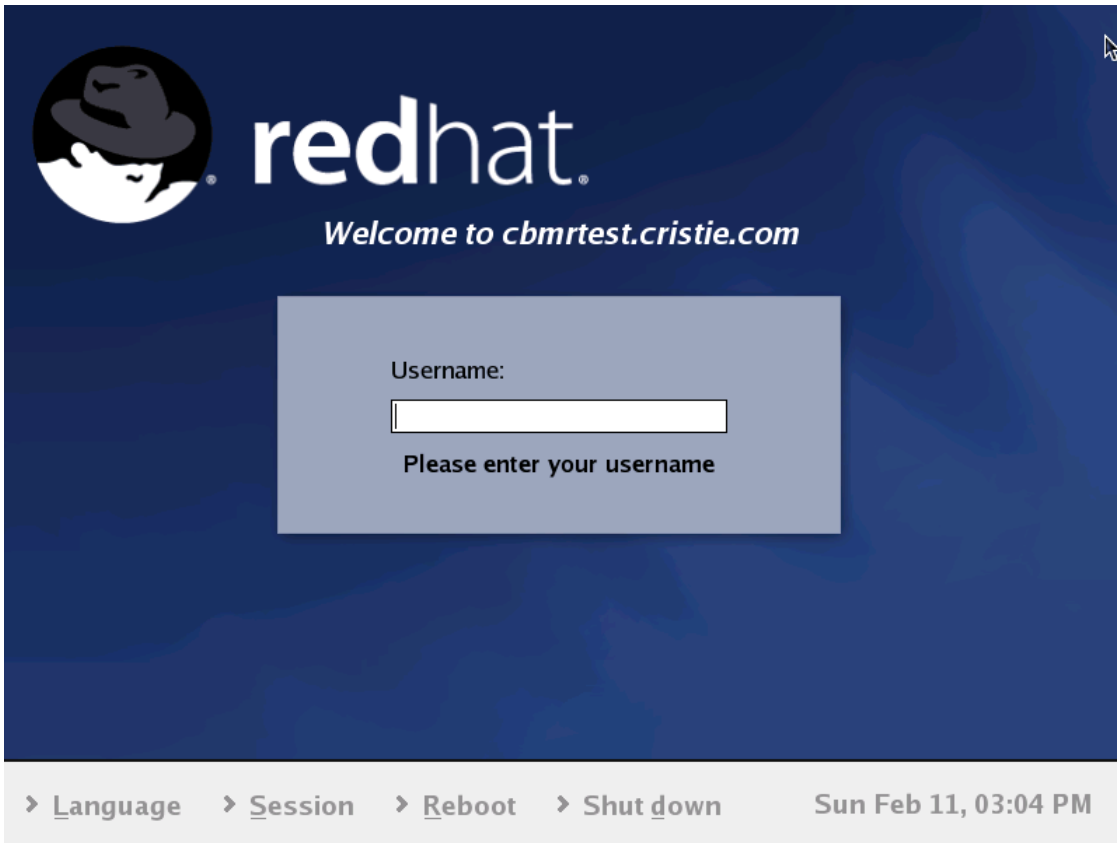
From the Main Menu choose EXIT AND REBOOT. Make certain that you remove the CD and the floppy from their drives.


GNU GRUB version 0.95 (638K lower / 391104K upper memory)
CBMR Recovery
Red Hat Linux (2.4.20-8)
Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the
commands before booting, 'a' to modify the kernel arguments
before booting, or 'c' for a command-line.
The highlighted entry will be booted automatically in 7 seconds.
redhat.

There may now be two initial RAMdisks to choose from depending on the Linux distribution that you are using. The original one will be useless because you are running on different hardware and the new one which is named CBMR Recovery. The old RAMdisk will only work on the old hardware. Select the CBMR Recovery which should also be the default.

The system should now boot up.


Booting 'CBMR Recovery'
root (hd0,0)
Filesystem type is ext2fs, partition type 0x83
kernel /vmlinuz-2.4.20-8 ro root=LABEL=/ hdc=ide-scsi
[Linux-bzImage, setup=0x1400, size=0x11098a]
initrd /initrd-2.4.20-8.cbmr1171029274
[Linux-initrd @ 0x17e97000, 0x48368 bytes]
Uncompressing Linux... Ok, booting the kernel.



Your machine will reboot to the state it was in when it was backed up. Once it reboots you may continue by recovering the Application data from a backup.

APPENDIX A

Supported Software

Linux Versions

	For glibc22:	For glibc23:
	32-bit	32-bit
Redhat	7.1, 7.2, 7.3, 8.0	9
Redhat Enterprise	2.1 AS/ES/WS	3 onwards
SUSE	7.1, 7.2, 7.3, 8.0, 8.1	8.2 onwards
Mandrake	8.0, 8.1, 8.2, 9.0	9.1 onwards
Knoppix	3.1	3.2 onwards
Slackware	8.0, 8.1	9.0 onwards
Gentoo	1.0, 1.1a, 1.2	1.4 onwards
Fedora		Core 1 onwards
Debian	3.0	

Supported File Systems

The file systems that are currently supported are:

ext2, ext3, minix, jfs, msdos, reiserfs, fat, vfat, xfs